SAMSUNG

SYSTEM AIR CONDITIONER

OUTDOOR UNIT

AM080/100/120/140/160/180/200/220FXV✳✳✳

SERVICE Manual

AIR CONDITIONER

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Refer to the service manual in the GSPN(see the rear cover) for the more information.

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1. Precautions

1-1 Precautions for the Service

- **Use the correct parts when changing the electric parts.**
  – Please check the labels and notices for the model name, proper voltage, and proper current for the electric parts.
- **Fully repair the connection for the types of harness when repairing the product after breakdown.**
  – A faulty connection can cause irregular noise and problems.
- **When disassembling or assembling, make sure that the product is laid down on a work cloth.**
  – Doing so will prevent scratching to the exterior of the rear side of the product.
- **Completely remove dust or foreign substances on the housing, connection, and inspection parts when performing repairs.**
  – This can prevent fire hazards for tracking, short, etc.
- **Please tighten the service valve of the outdoor unit and the valve cap of the charging valve as securely as possible by using a monkey spanner.**
- **Check whether the parts are properly and securely assembled after performing repairs.**
  – These parts should be in the same condition as before the repair.

1-2 Precautions for the Static Electricity and PL

- **Please carefully handle the PCB power terminal during repair and measurement when it is turned on since it is vulnerable to static electricity.**
  – Please wear insulation gloves before performing PCB repair and measurement.
- **Check if the place of installation is at least 2m away from electronic appliances such as TV, video players, and stereos.**
  – This can cause irregular noise or degrade the picture quality.
- **Please make sure the customer does not directly repair the product.**
  – Arbitrary dismantling may result in electric shock or fire.

1-3 Precautions for the Safety

- **Do not pull or touch the power plug or the subsidiary power switch with wet hands.**
  – This may result in electric shock or fire.
- **If the power line or the power plug is damaged, then it must be changed since this is a hazard.**
- **Do not bend the wire too much or position it so that it can be damaged by a heavy object on top.**
  – This may result in electric shock or fire.
- **The use of multiple electric outlets should be prohibited.**
  – This may result in electric shock or fire.
- **Ground the connection if it is necessary.**
  – The connection must be grounded if there is any risk of electrical short due to water or moisture.
- **Unplug the power or turn off the subsidiary power switch when changing or repairing electrical parts.**
  – Doing so will prevent electric shock.
- **Explain to workers that the battery for the remote control needs to be separated for storage purposes when the product will not be used for a long time.**
  – This can cause a problem for the remote control since battery fluid may trickle out.

1-4 Precautions for Handling Refrigerant for Air Conditioner

Environmental Cautions: Air pollution due to gas release

- **Safety Cautions**
  If liquid gas is released, then body parts that come into contact with it may experience frostbite/blister/numbness.
  If a large amount of gas is released, then suffocation may occur due to lack of oxygen. If the released gas is heated, then noxious gas may be produced by combustion.
- **Container Handling Cautions**
  Do not subject container to physical shock or overheating. (Flowage is possible while moving within the regulated pressure.)

1-5 Precautions for Welding the Air Conditioner Pipe

- **Dangerous or flammable objects around the pipe must be removed before the welding.**
- **If the refrigerant is kept inside the product or the pipe, then remove the refrigerant prior to welding.**
  If the welding is carried out while the refrigerant is kept inside, the welding cannot be properly performed. This will also produce noxious gas that is a health hazard. This leakage will also explode with the refrigerant and oil due to an increase in the refrigerant pressure, posing a danger to workers.
- **Please remove the oxide produced inside the pipe during the welding with nitrogen gas.**
  Using another gas may cause harm to the product or others.

1-6 Precautions for Additional Supplement of Air Conditioner Refrigerant

- **Precisely calculate the refrigerant by using a scale and S-net, and proceed with the test operation.**
  Excessive supplement can cause harm to the product since it can cause an inflow of the liquid refrigerant into the compressor.
- **Do not heat the refrigerant container for a forced injection.**
  This may cause harm to the product or others since the refrigerant container may burst.
- **Do not operate the product after removing the product safety pressure switch and sensor.**
  If the product is blocked inside, then this may cause harm to the product or others due to the excess pressure increase of the refrigerant gas.

1-7 Other Precautions

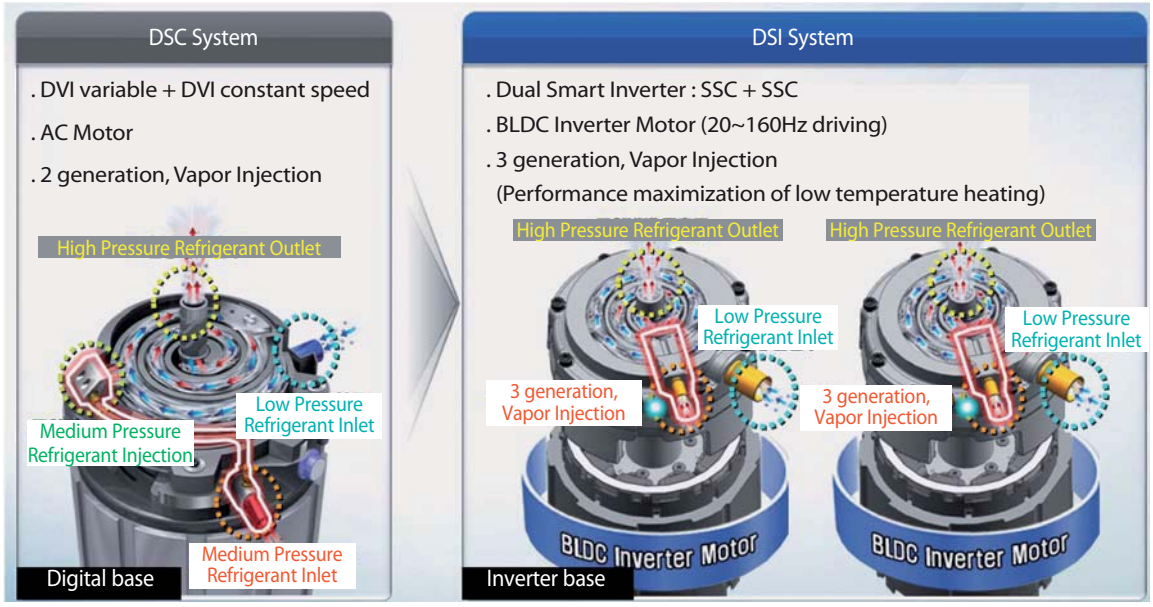
- **There should be no leakage of the pipes after installation. When withdrawing the refrigerant, the compressor should be stopped before removing the connecting pipe.**
  If the compressor is operating while the refrigerant pipe is not correctly connected and the service valve is opened, then air and other substances can enter the pipe. The interior of the refrigerant cycle may then build up excessive high pressure resulting in explosion and damage.

2. Product Specifications

2-1 The Feature of Product

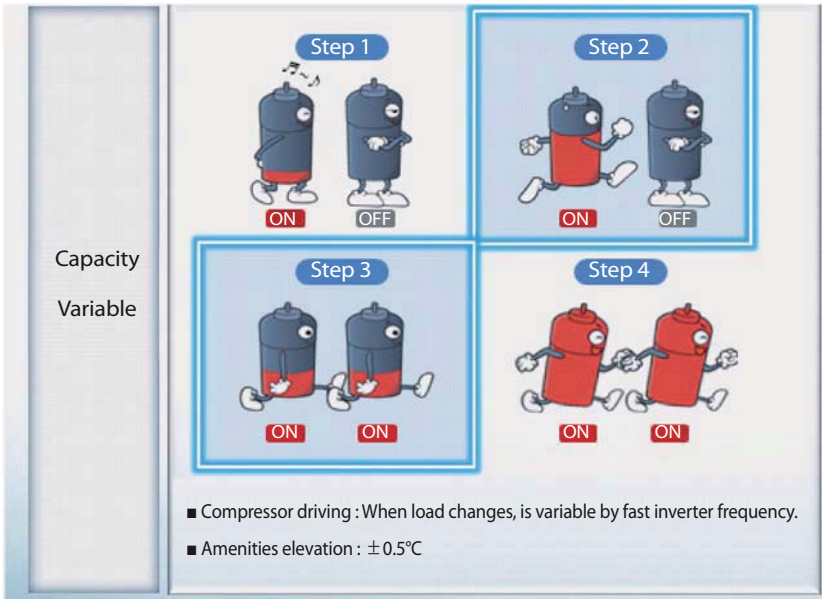
2-1-1 Feature

■ Dual Smart Inverter System


DSC System
. DVI variable + DVI constant speed
. AC Motor
. 2 generation, Vapor Injection
High Pressure Refrigerant Outlet
Low Pressure Refrigerant Inlet
Medium Pressure Refrigerant Injection
Medium Pressure Refrigerant Inlet
Digital base
DSI System
. Dual Smart Inverter : SSC + SSC
. BLDC Inverter Motor (20~160Hz driving)
. 3 generation, Vapor Injection
(Performance maximization of low temperature heating)
High Pressure Refrigerant Outlet
High Pressure Refrigerant Outlet
Low Pressure Refrigerant Inlet
Low Pressure Refrigerant Inlet
3 generation, Vapor Injection
3 generation, Vapor Injection
BLDC Inverter Motor
BLDC Inverter Motor
Inverter base

■ Dual SSC System Technology

When load changes, capacity amendment that is soft by continuous operation of Dual Inverter is available.

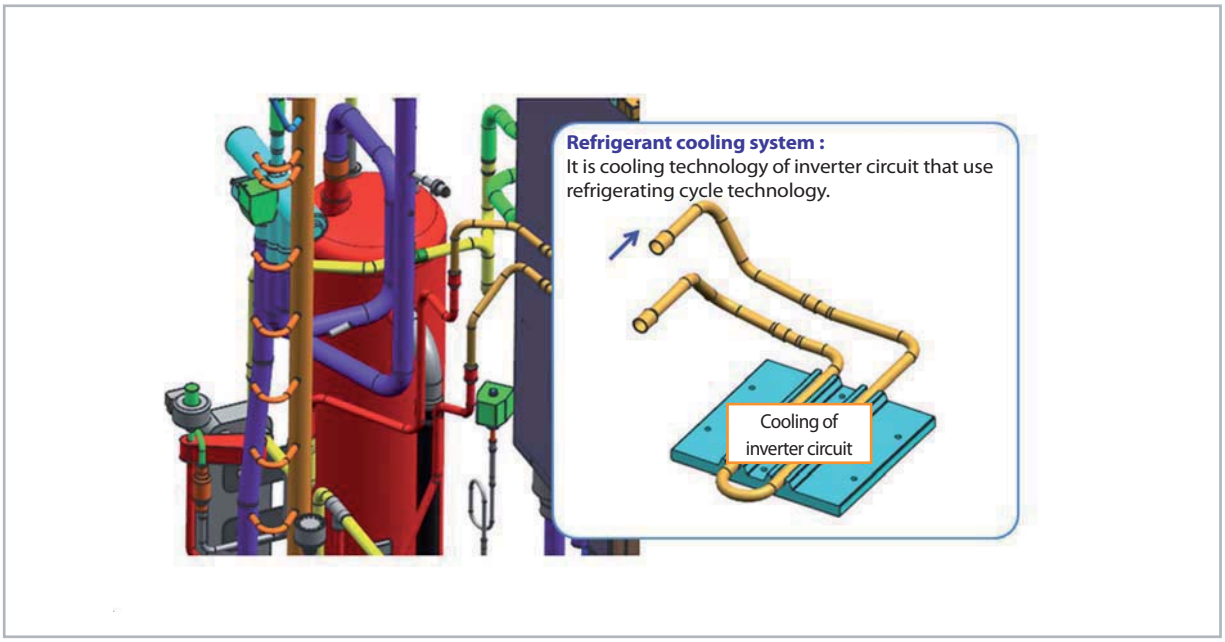


Feature (cont.)

■ Inverter circuit refrigerant cooling technology

Applied high efficiency refrigerant cooling circuit. Secured stable Inverter PCB cooling performance.

- Air cooling method : When natural convection / electric heat performance is low and is high load, efficiency is fallen.
- Refrigerant cooling system : Forced circulation / electric heat performance is high and control of (thermal conductivity is 10 times higher than air) load is available.


Refrigerant cooling system :
It is cooling technology of inverter circuit that use refrigerating cycle technology.
Cooling of inverter circuit

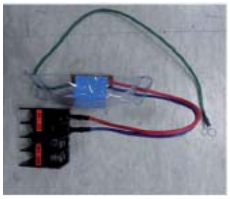
2-1-2 Changes in comparison to basic mode

Changed part	Changed item and feature	Basic	After changed
CABINET	Change the color : TOUCH GRAY →EARTH BROWN Wire Harness installation part change LOGO change		

■ Control Box & PCB

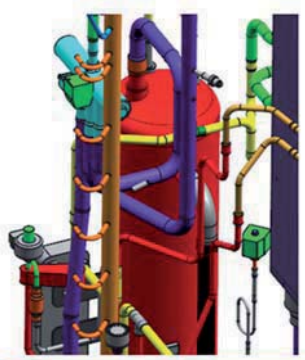
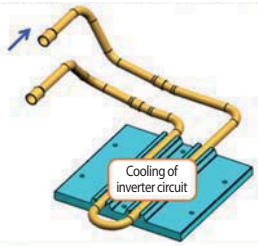
Changed part	Changed item and feature	Basic	After changed
Control Box structure	Monolayer structure→Double Layer Structure - Inverter technology integration (Inverter control circuit composition) - C/Box volume maximum use Built-in type Controller embodiment - Integrated power supply + control unit - Piping service easiness	 	

Changes in comparison to basic mode (cont.)

Changed part	Changed item and feature	Basic	After changed
Main PCB	Change Main PCB - Separation for load / control. - Option resistance delete by model. (standardization) - When do PCB replace, need option download.		
Hub PCB	Hub PCB newly application - Separation for load / control. - Enhanced fixing of load / sensor wire.		
FAN PCB	Use controller of 3 phase power - Prevented phase unbalance. - Temperature protection of IPM.		
Inverter PCB (Compressor Control PCB)	Applied inverter Compressor - Refrigerant cooling method - Magnet S/W → Did Power Relay mount to PCB.		
EMI PCB	3 phase power EMI PCB - Fuse mount	-	
Communication Terminal block	Did Communication Terminal block mount to PCB.		

Changes in comparison to basic mode (cont.)

■ PIPE COOLING

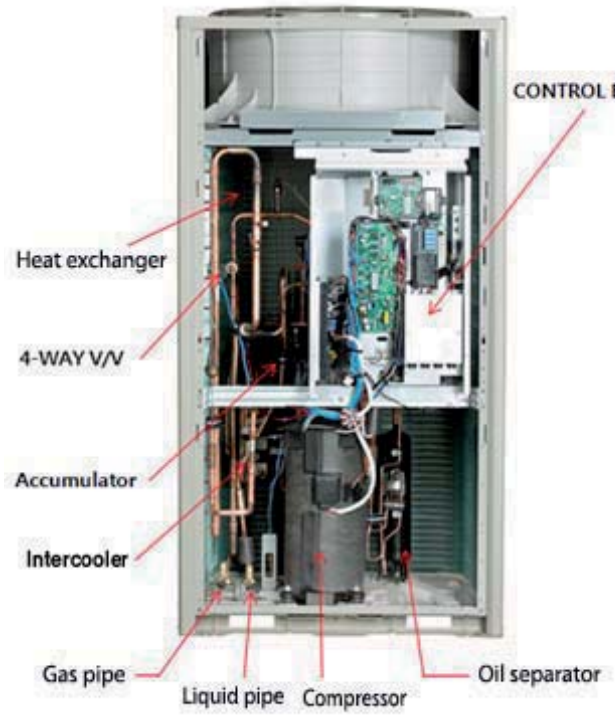
Changed part	Changed item and feature	Basic	After changed
Pipe Cooling	New Pipe Cooling for cooling of inverter PCB.	Unapplied	 Refrigerant cooling system : It is cooling technology of inverter circuit that use refrigerating cycle technology. 

■ TUBE

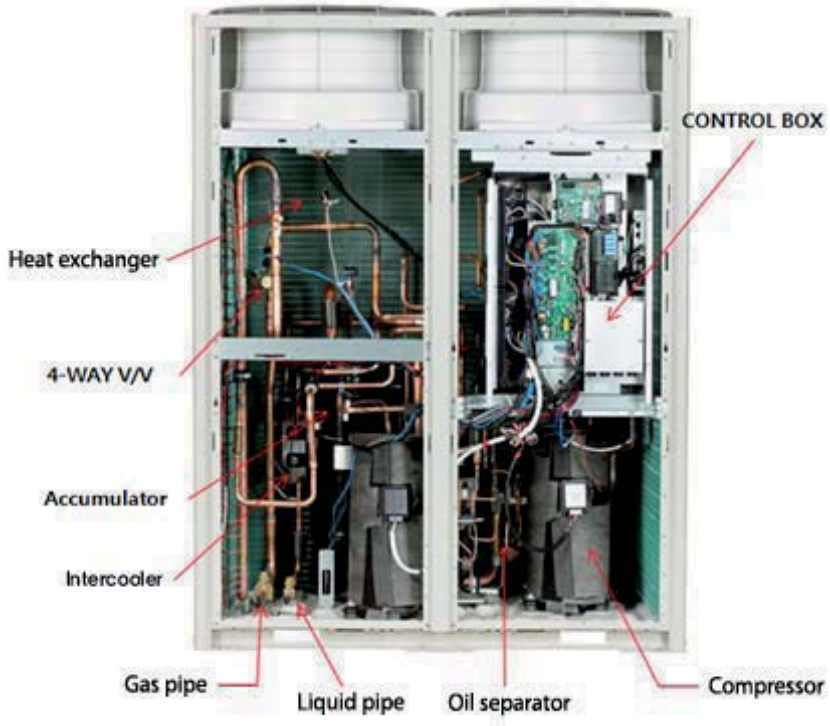
Changed part	Changed item and feature	Basic	After changed [HP]	After changed [HR]
Tube structure	New inverter cycle technology application New piping			

2-1-3 Structure of product (Heat Pump)

Small size

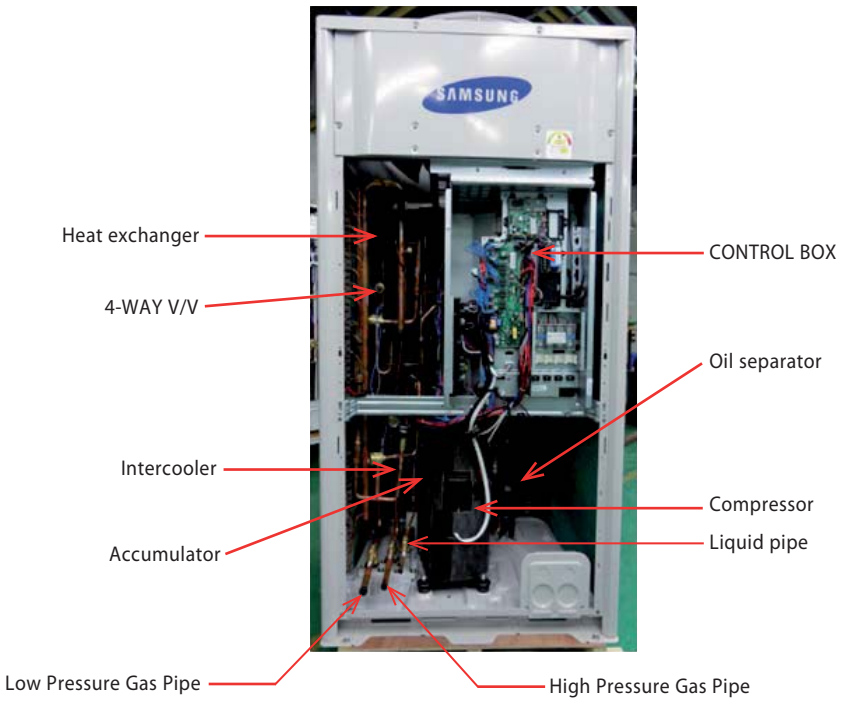


Large size

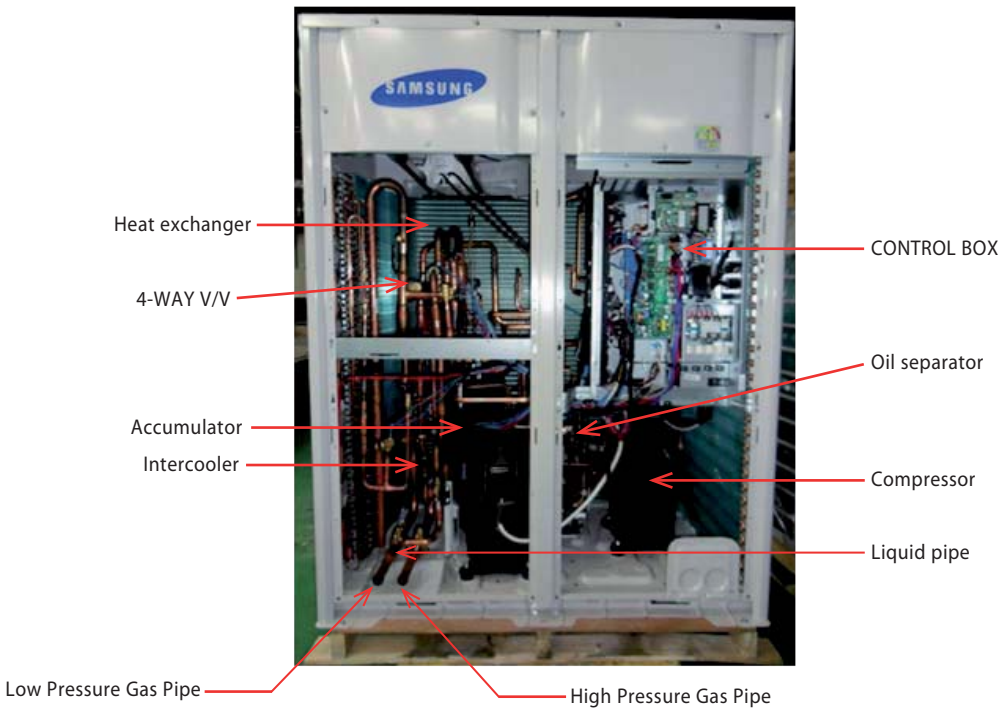


2-1-4 Structure of product (Heat Recovery)

Small size



Large size



2-2 Product Specifications

2-2-1 Outdoor Unit

TYPE				New Model			Comparative Model		
Model				AM080FXVAGH	AM100FXVAGH	AM120FXVAGH	RD080HHXG✳	RD100HHXG✳	RD120HHXG✳
Mode				HP	HP	HP	HP	HP	HP
Power			Ø,V,Hz	3/AC380~415/50	3/AC380~415/50	3/AC380~415/50	3/AC380~415/50	3/AC380~415/50	3/AC380~415/50
Capacity	Horse Power		HP	8	10	12	8	10	12
	Cooling		kW	22.4	28.0	33.6	22.4	28.0	33.6
			btu/h	76,400	95,500	114,600	76,400	95,500	114,600
	Heating		kW	25.2	31.5	37.8	25.2	31.5	37.8
			btu/h	86,000	107,500	129,000	86,000	107,500	129,000
Power	Power Input (Nominal)	Cooling 1)	kW	5.00	6.80	8.40	-	-	-
		Heating 2)		5.10	6.70	8.70	-	-	-
	Current Input (Nominal)	Cooling 1)	A	8.00	10.90	13.50	-	-	-
		Heating 2)		8.20	10.70	14.00	-	-	-
	Running Current	Cooling	A	8.00	10.90	13.50	8.80	13.00	20.00
		Heating	A	8.20	10.70	14.00	11.40	12.70	18.40
		Max.	A	18.00	21.10	25.00	18.40	21.50	28.40
	Power Consumption	Cooling	kW	5.00	6.80	8.40	5.20	7.04	9.20
		Heating	kW	5.10	6.70	8.70	5.46	6.89	8.50
	MCA / MFA		A	22.5 / 30	29.9 / 40	31.3 / 40	-	-	-
COP	Nominal Cooling		-	4.48	4.12	4.00	-	-	-
	Nominal Heating		-	4.94	4.70	4.34	-	-	-
	ESEER (HP)			7.85	7.25	7.03	-	-	-
Compressor	Model		-	DS-GB052FA****	DS-GB066FA****	DS-GB066FA****	ZPJ61KCE-TFD ZPI61KCE-TFD	ZPJ61KCE-TFD ZPI61KCE-TFD	ZPJ83KCE-TFD ZPI83KCE-TFD
	Type			INV x1	INV x1	INV x1	DVI x1 + FVI x1	DVI x1 + FVI x1	DVI x1 + FVI x1
	Output		kW	4.70	5.80	5.80	4.36 + 4.36	4.36 + 4.36	5.87 + 5.87
	Lubricant	Type	-	FVC68D	FVC68D	FVC68D	3MAF POE	3MAF POE	3MAF POE
		Charging	cc	3,900	3,900	3,900	4,370	4,370	4,370
Refrigerant	Type		-	R410A	R410A	R410A	R410A	R410A	R410A
	Factory Charging		kg	5.5	5.2	5.5	5.0	5.0	5.0
FAN	Type		-	Propeller + BLDC	Propeller + BLDC	Propeller + BLDC	Propeller + BLDC	Propeller + BLDC	Propeller + BLDC
	Motor Output		W	400	400	400	630	630	630
	Airflow rate		㎥/min	173	173	210	173	173	210
Pipe	Piping Connections	Liquid	Ø,mm	9.52	9.52	12.70	9.52	9.52	12.70
			Ø,inch	3/8"	3/8"	1/2"			
		Gas	Ø,mm	19.05	22.22	28.58	19.05	22.22	25.40
			Ø,inch	3/4"	7/8"	1 1/8"			
		Dis. Gas	Ø,mm	15.88	19.05	19.05	-	-	-
			Ø,inch	5/8"	3/4"	3.4"			
	Installation Limitation	Max.Length	m	200(220)	200(220)	200(220)	200	200	200
		Max.Height	m	110(40)	110(40)	110(40)	50(40)	50(40)	50(40)
Cable	Main Power(Below/about20m)		mm2	4.0	4.0	4.0	1.5	2.5	4.0
	Communication		mm2	VCTF 0.75~1.5(2P)	VCTF 0.75~1.5(2P)	VCTF 0.75~1.5(2P)	VCTF 0.75~1.5(2P)	VCTF 0.75~1.5(2P)	VCTF 0.75~1.5(2P)
Set Dimension	Net Weight	DVM S HP	kg	190.0	190.0	190.0	237	237	240
		DVM S HR		195.0	195.0	195.0			
	Shipping Weight	DVM S HP	kg	206.0	206.0	206.0	253	253	256
		DVM S HR		211.0	211.0	211.0			
	Net Dimension(WxHxD)		mm	880x1,695x765	880x1,695x765	880x1,695x765	880x1695x765	880x1695x765	880x1695x765
	Gross Dimension(WxHxD)		mm	948x1,657x832	948x1,657x832	948x1,657x832	948x1912x832	948x1912x832	948x1912x832
Operating Temp Range	Cooling	DVM S HP	℃	-5.0~48.0	-5.0~48.0	-5.0~48.0	-5.0 ~ 48	-5.0 ~ 48.0	-5.0 ~ 48.0
		DVM S HR		-15.0~48.0	-15.0~48.0	-15.0~48.0			
	Heating			-20.0~24.0	-20.0~24.0	-20.0~24.0	-20.0 ~ 24.0	-20.0 ~ 24.0	-20.0 ~ 24.0

1. Proper form capacity standard of air conditioning
- Cooling capacity : It is figures that appear in indoor 27˚C DB/19ºC WB, outdoor 35˚C DB, length 7.5m of piping, fall 0m standard.
- Heating capacity : It is figures that appear in indoor 20˚C DB, outdoor 7˚C DB, length 7.5m of piping, fall 0m standard.
2. If proper form heating capacity is outdoor temperature 7˚C standard and outdoor temperature goes down by below zero, heating capacity can drop according to temperature condition.
3. Need special load calculation in case of use by main heating in the winter, and please buy product for low temperature that heating effect excels at low temperature.
4. Maximum length between outdoor and indoor units allows up to 200m (Equivalent length 220m).
5. If the indoor unit is below, height length allows up to 110m (If over 50m, decide whether to install the PDM kit). If the outdoor unit is below, allowable height length is 40m.

Outdoor Unit(Continue)

TYPE				New Model		Comparative Model	
Model				AM140FXVAGH	AM160FXVAGH	RD140HHXG*	RD160HHXG*
Mode				HP	HP	HP	HP
Power			Ø,V,Hz	3/AC380~415/50	3/AC380~415/50	3/AC380~415/50	3/AC380~415/50
Capacity	Horse Power		HP	14	16	14	16
	Capacity		kW	40.0	45.0	39.2	44.8
			btu/h	136,000	153,000	133,800	152,900
	Heating		kW	45.0	50.0	44.1	50.0
			btu/h	153,000	170,000	150,500	172,000
Power	Power Input (Nominal)	Cooling 1)	kW	8.90	11.00	-	-
		Heating 2)		9.50	11.50	-	-
	Current Input (Nominal)	Cooling 1)	A	14.30	17.60	-	-
		Heating 2)		15.20	18.40	-	-
	Running Current	Cooling	A	14.30	17.60	20.90	22.00
		Heating	A	15.20	18.40	19.40	27.20
		Max.	A	25.00	32.00	29.40	38.30
	Power Consumption	Cooling	kW	8.90	11.00	10.10	12.00
		Heating	kW	9.50	11.50	9.65	11.30
	MCA / MFA		A	31.3 / 40	40 / 40	-	-
COP	Nominal Cooling		-	4.49	4.09	-	-
	Nominal Heating		-	4.74	4.35	-	-
	ESEER (HP)			7.02	6.78	-	-
Compressor	Model		-	DS-GB066FA****	DS-GB052FA****	ZPJ83KCE-TFD ZPI83KCE-TFD	ZPJ72KCE-TFD ZPI72KCE-TFD
	Type			INV x1	INV x2	DVI x1 + FVI x1	DVI x1 + FVI x2
	Output		kW	5.80	4.7 x2	5.87 + 5.87	5.16 + 5.16 x2
	Lubricant	Type	-	FVC68D	FVC68D	3MAF POE	3MAF POE
		Charging	cc	3,900	6,200	4,370	6,540
Refrigerant	Type		-	R410A	R410A	R410A	R410A
	Factory Charging		kg	7.7	7.4	7.0	7.0
FAN	Type		-	Propeller + BLDC	Propeller + BLDC	Propeller + BLDC	Propeller + BLDC
	Motor Output		W	630 x 2	630 x 2	630 x 2	630 x 2
	Airflow rate		m^3 / min	226	250	226	250
Pipe	Piping Connections	Liquid	Ø,mm	12.70	12.70	12.70	12.70
			Ø,inch	1/2"	1/2"		
		Gas	Ø,mm	28.58	28.58	25.40	28.58
			Ø,inch	1 1/8"	1 1/8"		
		Dis. Gas	Ø,mm	19.05	22.22	-	-
			Ø,inch	3/4"	7/8"		
	Installation Limitation	Max.Length	m	200(220)	200(220)	200	200
		Max.Height	m	110(40)	110(40)	50(40)	50(40)
Cable	Main Power(Below/about20m)		mm2	4.0	6.0	4.0	6.0
	Communication		mm2	VCTF 0.75~1.5(2P)	VCTF 0.75~1.5(2P)	VCTF 0.75~1.5(2P)	VCTF 0.75~1.5(2P)
Set Dimension	Net Weight	DVM S HP	kg	235.0	278.0	280	329
		DVM S HR		214.0	184.0		
	Shipping Weight	DVM S HP	kg	254.0	297.0	301	350
		DVM S HR		260.0	303.0		
	Net Dimension(WxHxD)		mm	1295x1695x765	1295x1695x765	1295x1695x765	1295x1695x765
	Gross Dimension(WxHxD)		mm	1363x1857x832	1363x1857x832	1363x1912x832	1363x1912x832
Operating Temp Range	Cooling	DVM S HP	℃	-5.0~48.0	-5.0~48.0	-5.0 ~ 48.0	-5.0 ~ 48.0
		DVM S HR		-15.0~48.0	-15.0~48.0		
	Heating			-20.0~24.0	-20.0~24.0	-20.0 ~ 24.0	-20.0 ~ 24.0

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- Heating capacity : It is figures that appear in indoor 20˚C DB, outdoor 7˚C DB, length 7.5m of piping, fall 0m standard.
2. If proper form heating capacity is outdoor temperature 7˚C standard and outdoor temperature goes down by below zero, heating capacity can drop according to temperature condition.
3. Need special load calculation in case of use by main heating in the winter, and please buy product for low temperature that heating effect excels at low temperature.
4. Maximum length between outdoor and indoor units allows up to 200m (Equivalent length 220m).
5. If the indoor unit is below, height length allows up to 110m (If over 50m, decide whether to install the PDM kit). If the outdoor unit is below, allowable height length is 40m.

Outdoor Unit(Continue)

TYPE				New Model			Comparative Model	
Model				AM180FXVAGH	AM200FXVAGH	AM220FXVAGH	RD180HHXG✳	RD200HHXG✳
Mode				HP	HP	HP	HP	HP
Power			Ø,V,Hz	3/AC380~415/50	3/AC380~415/50	3/AC380~415/50	3/AC380~415/50	3/AC380~415/50
Capacity	Horse Power		HP	18	20	22	18	20
	Cooling		kW	50.4	56.0	61.6	50.4	56.0
			btu/h	171,900	191,000	210,000	171,900	191,000
	Heating		kW	56.7	63.0	69.3	56.7	63.0
			btu/h	193,500	215,000	236,000	193,500	215,000
Power	Power Input (Nominal)	Cooling 1)	kW	12.80	15.19	17.35	-	-
		Heating 2)		11.90	13.90	16.70	-	-
	Current Input (Nominal)	Cooling 1)	A	20.70	24.40	27.80	-	-
		Heating 2)		19.10	22.30	26.80	-	-
	Running Current	Cooling	A	20.70	24.40	27.80	31.30	32.80
		Heating	A	19.10	22.30	26.80	26.70	29.10
		Max.	A	39.10	42.50	44.50	42.50	44.10
	Power Consumption	Cooling	kW	12.88	15.19	17.35	15.70	17.00
		Heating	kW	11.90	13.90	16.70	12.90	14.50
	MCA / MFA		A	48.9 / 50	52.5 / 75	52.5 / 75	-	-
COP	Nominal Cooling		-	3.91	3.69	3.55	-	-
	Nominal Heating		-	4.76	4.53	4.15	-	-
	ESEER (HP)			6.59	6.56	6.25	-	-
Compressor	Model		-	DS-GB066FA****	DS-GB066FA****	DS-GB066FA****	ZPJ83KCE-TFD ZPI83KCE-TFD	ZPJ83KCE-TFD ZPI83KCE-TFD
	Type			INV x2	INV x2	INV x2	DVI x1 + FVI x2	DVI x1 + FVI x2
	Output		kW	5.8 x2	5.8 x2	5.8 x2	5.87 + 5.87 x2	5.87 + 5.87 x2
	Lubricant	Type	-	FVC68D		FVC68D	3MAF POE	3MAF POE
		Charging	cc	6,200	6,200	6,200	6,540	6,540
Refrigerant	Type		-	R410A	R410A	R410A	R410A	R410A
	Factory Charging		kg	8.7	8.4	8.4	8.5	8.5
FAN	Type		-	Propeller + BLDC	Propeller + BLDC	Propeller + BLDC	Propeller + BLDC	Propeller + BLDC
	Motor Output		W	630 x2	630 x2	630 x2	630 x2	630 x2
	Airflow rate		㎥ /min	270	275	280	270	275
Pipe	Piping Connections	Liquid	Ø,mm	15.88	15.88	15.88	15.88	15.88
			Ø,inch	5/8"	5/8"	5/8"		
		Gas	Ø,mm	28.58	28.58	28.58	28.58	28.58
			Ø,inch	1 1/8"	1 1/8"	1 1/8"		
		Dis. Gas	Ø,mm	22.22	28.58	28.58	-	-
			Ø,inch	7/8"	1 1/8"	1 1/8"		
	Installation Limitation	Max.Length	m	200(220)	200(220)	200(220)	200	200
		Max.Height	m	110(40)	110(40)	110(40)	50(40)	50(40)
Cable	Main Power(Below/about20m)		mm2	10.0	10.0	10.0	6.0	10.0
	Communication		mm2	VCTF 0.75~1.5(2P)	VCTF 0.75~1.5(2P)	VCTF 0.75~1.5(2P)	VCTF 0.75~1.5(2P)	VCTF 0.75~1.5(2P)
Set Dimension	Net Weight	DVM S HP	kg	300.0	300.0	300.0	340.0	349.0
		DVM S HR		306.0	306.0	306.0		
	Shipping Weight	DVM S HP	kg	319.0	319.0	319.0	361.0	370.0
		DVM S HR		325.0	325.0	325.0		
	Net Dimension(WxHxD)		mm	1295x1695x765	1295x1695x765	1295x1695x765	1295x1695x765	1295x1695x765
	Gross Dimension(WxHxD)		mm	1363x1857x832	1363x1857x832	1363x1857x832	1363x1912x832	1363x1912x832
Operating Temp Range	Cooling	DVM S HP	℃	-5.0 ~ 48.0	-5.0 ~ 48.0	-5.0 ~ 48.0	-5.0~ 48.0	-5.0 ~ 48.0
		DVM S HR		-15.0~48.0	-15.0~48.0	-15.0~48.0		
	Heating			-20.0 ~ 24.0	-20.0 ~ 24.0	-20.0 ~ 24.0	-20.0 ~ 24.0	-20.0 ~ 24.0

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Outdoor Unit(Continue)

TYPE				New Model			Comparative Model		
Model				AM080FXVAGR	AM100FXVAGR	AM120FXVAGR	RD080HRXG*	RD100HRXG*	RD120HRXG*
Mode				HR	HR	HR	HR	HR	HR
Power			Ø,V,Hz	3/AC380~415/50	3/AC380~415/50	3/AC380~415/50	3/AC380~415/50	3/AC380~415/50	3/AC380~415/50
Capacity	Horse Power		HP	8	10	12	8	10	12
	Capacity		kW	22.4	28.0	33.6	22.4	28.0	33.6
			btu/h	76,400	95,500	114,600	76,400	95,500	114,600
	Heating		kW	25.2	31.5	37.8	25.2	31.5	37.8
			btu/h	86,000	107,500	129,000	86,000	107,500	129,000
Power	Power Input (Nominal)	Cooling 1)	kW	5.00	6.80	8.40	-	-	-
		Heating 2)		5.10	6.70	8.70	-	-	-
	Current Input (Nominal)	Cooling 1)	A	8.00	10.90	13.50	-	-	-
		Heating 2)		8.20	10.70	14.00	-	-	-
	Running Current	Cooling	A	8.00	10.90	13.50	8.80	13.00	20.00
		Heating	A	8.20	10.70	14.00	11.40	12.70	18.40
		Max.	A	18.00	21.10	25.00	18.40	21.50	28.40
	Power Consumption	Cooling	kW	5.00	6.80	8.40	5.20	7.04	9.20
		Heating	kW	5.10	6.70	8.70	5.46	6.89	8.50
	MCA / MFA		A	22.5 / 30	29.9 / 40	31.3 / 40	-	-	-
COP	Nominal Cooling		-	4.48	4.12	4.00	-	-	-
	Nominal Heating		-	4.94	4.70	4.34	-	-	-
	ESEER (HP)			7.85	7.25	7.03	-	-	-
Compressor	Model		-	DS-GB052FA****	DS-GB066FA****	DS-GB066FA****	ZPJ61KCE-TFD ZPI61KCE-TFD	ZPJ61KCE-TFD ZPI61KCE-TFD	ZPJ83KCE-TFD ZPI83KCE-TFD
	Type			INV x1	INV x1	INV x1	DVI x1 + FVI x1	DVI x1 + FVI x1	DVI x1 + FVI x1
	Output		kW	4.70	5.80	5.80	4.36 + 4.36	4.36 + 4.36	5.87 + 5.87
	Lubricant	Type	-	FVC68D	FVC68D	FVC68D	3MAF POE	3MAF POE	3MAF POE
		Charging	cc	3,900	3,900	3,900	4,370	4,370	4,370
Refrigerant	Type		-	R410A	R410A	R410A	R410A	R410A	R410A
	Factory Charging		kg	5.5	5.2	5.5	5.0	5.0	5.0
FAN	Type		-	Propeller + BLDC	Propeller + BLDC	Propeller + BLDC	Propeller + BLDC	Propeller + BLDC	Propeller + BLDC
	Motor Output		W	400	400	400	630	630	630
	Airflow rate		㎥ /min	173	173	210	173	173	210
Pipe	Piping Connections	Liquid	Ø,mm	9.52	9.52	12.70	9.52	9.52	12.70
			Ø,inch	3/8"	3/8"	1/2"			
		Gas	Ø,mm	19.05	22.22	28.58	19.05	22.22	25.40
			Ø,inch	3/4"	7/8"	1 1/8"			
		Dis. Gas	Ø,mm	15.88	19.05	19.05	15.88	19.05	22.22
			Ø,inch	5/8"	3/4"	3.4"			
	Installation Limitation	Max.Length	m	200(220)	200(220)	200(220)	200	200	200
		Max.Height	m	110(40)	110(40)	110(40)	50(40)	50(40)	50(40)
Cable	Main Power(Below/about20m)		mm2	4.0	4.0	4.0	1.5	2.5	4.0
	Communication		mm2	VCTF 0.75~1.5(2P)	VCTF 0.75~1.5(2P)	VCTF 0.75~1.5(2P)	VCTF 0.75~1.5(2P)	VCTF 0.75~1.5(2P)	VCTF 0.75~1.5(2P)
Set Dimension	Net Weight	DVM S HP	kg	190.0	190.0	190.0	243	243	243
		DVM S HR		195.0	195.0	195.0			
	Shipping Weight	DVM S HP	kg	206.0	206.0	206.0	259	259	259
		DVM S HR		211.0	211.0	211.0			
	Net Dimension(WxHxD)		mm	880x1,695x765	880x1,695x765	880x1,695x765	880x1695x765	880x1695x765	880x1695x765
	Gross Dimension(WxHxD)		mm	948x1,657x832	948x1,657x832	948x1,657x832	948x1912x832	948x1912x832	948x1912x832
Operating Temp Range	Cooling	DVM S HP	℃	-5.0~48.0	-5.0~48.0	-5.0~48.0	-5.0 ~ 48.0	-5.0 ~ 48.0	-5.0 ~ 48.0
		DVM S HR		-15.0~48.0	-15.0~48.0	-15.0~48.0			
	Heating			-20.0~24.0	-20.0~24.0	-20.0~24.0	-20.0 ~ 24.0	-20.0 ~ 24.0	-20 .0~ 24.0

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Outdoor Unit(Continue)

TYPE				New Model		Comparative Model	
Model				AM140FXVAGR	AM160FXVAGR	RD140HRXG✳	RD160HRXG✳
Mode				HR	HR	HR	HR
Power			Ø,V,Hz	3/AC380~415/50	3/AC380~415/50	3/AC380~415/50	3/AC380~415/50
Capacity	Horse Power		HP	14	16	14	16
	Capacity		kW	40.0	45.0	39.2	44.8
			btu/h	136,000	153,000	133,800	152,900
	Heating		kW	45.0	50.0	44.1	50.0
			btu/h	153,000	170,000	150,500	172,000
Power	Power Input (Nominal)	Cooling 1)	kW	8.90	11.00	-	-
		Heating 2)		9.50	11.50	-	-
	Current Input (Nominal)	Cooling 1)	A	14.30	17.60	-	-
		Heating 2)		15.20	18.40	-	-
	Running Current	Cooling	A	14.30	17.60	20.90	22.00
		Heating	A	15.20	18.40	19.40	27.20
		Max.	A	25.00	32.00	29.40	38.30
	Power Consumption	Cooling	kW	8.90	11.00	10.10	12.00
		Heating	kW	9.50	11.50	9.65	11.30
	MCA / MFA		A	31.3 / 40	40 / 40	-	-
COP	Nominal Cooling		-	4.49	4.09	-	-
	Nominal Heating		-	4.74	4.35	-	-
	ESEER (HP)			7.02	6.78	-	-
Compressor	Model		-	DS-GB066FA****	DS-GB052FA****	ZPJ83KCE-TFD ZPI83KCE-TFD	ZPJ72KCE-TFD ZPI72KCE-TFD
	Type			INV x1	INV x2	DVI x1 + FVI x1	DVI x1 + FVI x2
	Output		kW	5.80	4.7 x2	5.87 + 5.87	5.16 + 5.16 x2
	Lubricant	Type	-	FVC68D	FVC68D	3MAF POE	3MAF POE
		Charging	cc	3,900	6,200	4,370	6,540
Refrigerant	Type		-	R410A	R410A	R410A	R410A
	Factory Charging		kg	7.7	7.4	7.0	7.0
FAN	Type		-	Propeller + BLDC	Propeller + BLDC	Propeller + BLDC	Propeller + BLDC
	Motor Output		W	630 x 2	630 x 2	630 x 2	630 x 2
	Airflow rate		㎥ /min	226	250	226	250
Pipe	Piping Connections	Liquid	Ø,mm	12.70	12.70	12.70	12.70
			Ø,inch	1/2"	1/2"		
		Gas	Ø,mm	28.58	28.58	25.40	28.58
			Ø,inch	1 1/8"	1 1/8"		
		Dis. Gas	Ø,mm	19.05	22.22	22.22	25.40
			Ø,inch	3/4"	7/8"		
	Installation Limitation	Max.Length	m	200(220)	200(220)	200	200
		Max.Height	m	110(40)	110(40)	50(40)	50(40)
Cable	Main Power(Below/ about20m)		mm2	4.0	6.0	4.0	6.0
	Communication		mm2	VCTF 0.75~1.5(2P)	VCTF 0.75~1.5(2P)	VCTF 0.75~1.5(2P)	VCTF 0.75~1.5(2P)
Set Dimension	Net Weight	DVM S HP	kg	235.0	278.0	293	338
		DVM S HR		214.0	184.0		
	Shipping Weight	DVM S HP	kg	254.0	297.0	314	359
		DVM S HR		260.0	303.0		
	Net Dimension(WxHxD)		mm	1295x1695x765	1295x1695x765	1295x1695x765	1295x1695x765
	Gross Dimension(WxHxD)		mm	1363x1857x832	1363x1857x832	1363x1912x832	1363x1912x832
Operating Temp Range	Cooling	DVM S HP	℃	-5.0~48.0	-5.0~48.0	-5 .0~ 48.0	-5.0~ 48.0
		DVM S HR		-15.0~48.0	-15.0~48.0		
	Heating			-20.0~24.0	-20.0~24.0	-20.0~ 24.0	-20.0~ 24.0

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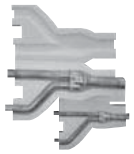
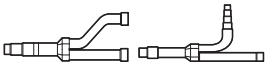
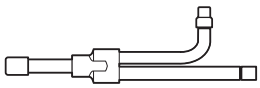
Outdoor Unit(Continue)

TYPE				New Model			Comparative Model	
Model				AM180FXVAGR	AM200FXVAGR	AM220FXVAGR	RD180HRXG✳	RD200HRXG✳
Mode				HR	HR	HR	HR	HR
Power			Ø,V,Hz	3/AC380~415/50	3/AC380~415/50	3/AC380~415/50	3/AC380~415/50	3/AC380~415/50
Capacity	Horse Power		HP	18	20	22	18	20
	Capacity		kW	50.4	56.0	61.6	50.4	56.0
			btu/h	171,900	191,000	210,000	171,900	191,000
	Heating		kW	56.7	63.0	69.3	56.7	63.0
			btu/h	193,500	215,000	236,000	193,500	215,000
Power	Power Input (Nominal)	Cooling 1)	kW	12.80	15.19	17.35	-	-
		Heating 2)		11.90	13.90	16.70	-	-
	Current Input (Nominal)	Cooling 1)	A	20.70	24.40	27.80	-	-
		Heating 2)		19.10	22.30	26.80	-	-
	Running Current	Cooling	A	20.70	24.40	27.80	31.30	32.80
		Heating	A	19.10	22.30	26.80	26.70	29.10
		Max.	A	39.10	42.50	44.50	42.50	44.10
	Power Consumption	Cooling	kW	12.88	15.19	17.35	15.70	17.00
		Heating	kW	11.90	13.90	16.70	12.90	14.50
	MCA / MFA		A	48.9 / 50	52.5 / 75	52.5 / 75	-	-
COP	Nominal Cooling		-	3.91	3.69	3.55	-	-
	Nominal Heating		-	4.76	4.53	4.15	-	-
	ESEER (HP)			6.59	6.56	6.25	-	-
Compressor	Model		-	DS-GB066FA****	DS-GB066FA****	DS-GB066FA****	ZPJ83KCE-TFD ZPI83KCE-TFD	ZPJ83KCE-TFD ZPI83KCE-TFD
	Type			INV x2	INV x2	INV x2	DVI x1 + FVI x2	DVI x1 + FVI x2
	Output		kW	5.8 x2	5.8 x2	5.8 x2	5.87 + 5.87 x2	5.87 + 5.87 x2
	Lubricant	Type	-	FVC68D		FVC68D	3MAF POE	3MAF POE
		Charging	cc	6,200	6,200	6,200	6,540	6,540
Refrigerant	Type		-	R410A	R410A	R410A	R410A	R410A
	Factory Charging		kg	8.7	8.4	8.4	8.5	8.5
FAN	Type		-	Propeller + BLDC	Propeller + BLDC	Propeller + BLDC	Propeller + BLDC	Propeller + BLDC
	Motor Output		W	630 x2	630 x2	630 x2	630 x2	630 x2
	Airflow rate		㎥ /min	270	275	280	270	275
Pipe	Piping Connections	Liquid	Ø,mm	15.88	15.88	15.88	15.88	15.88
			Ø,inch	5/8"	5/8"	5/8"		
		Gas	Ø,mm	28.58	28.58	28.58	28.58	28.58
			Ø,inch	1 1/8"	1 1/8"	1 1/8"		
		Dis. Gas	Ø,mm	22.22	28.58	28.58	28.58	28.58
			Ø,inch	7/8"	1 1/8"	1 1/8"		
	Installation Limitation	Max.Length	m	200(220)	200(220)	200(220)	200	200
		Max.Height	m	110(40)	110(40)	110(40)	50(40)	50(40)
Cable	Main Power(Below/ about20m)		mm2	10.0	10.0	10.0	6.0	10.0
	Communication		mm2	VCTF 0.75~1.5(2P)	VCTF 0.75~1.5(2P)	VCTF 0.75~1.5(2P)	VCTF 0.75~1.5(2P)	VCTF 0.75~1.5(2P)
Set Dimension	Net Weight	DVM S HP	kg	300.0	300.0	300.0	349	355
		DVM S HR		306.0	306.0	306.0		
	Shipping Weight	DVM S HP	kg	319.0	319.0	319.0	369	376
		DVM S HR		325.0	325.0	325.0		
	Net Dimension(WxHxD)		mm	1295x1695x765	1295x1695x765	1295x1695x765	1295x1695x765	1295x1695x765
	Gross Dimension(WxHxD)		mm	1363x1857x832	1363x1857x832	1363x1857x832	1363x1912x832	1363x1912x832
Operating Temp Range	Cooling	DVM S HP	℃	-5.0 ~ 48.0	-5.0 ~ 48.0	-5.0 ~ 48.0	-5.0 ~ 48.0	-5.0 ~ 48.0
		DVM S HR		-15.0~48.0	-15.0~48.0	-15.0~48.0		
	Heating			-20.0 ~ 24.0	-20.0 ~ 24.0	-20.0 ~ 24.0	-20.0 ~ 24.0	-20.0~ 24.0

1. Proper form capacity standard of air conditioning
- Cooling capacity : It is figures that appear in indoor 27˚C DB/19°C WB, outdoor 35˚C DB, length 7.5m of piping, fall 0m standard.
- Heating capacity : It is figures that appear in indoor 20˚C DB, outdoor 7˚C DB, length 7.5m of piping, fall 0m standard.
2. If proper form heating capacity is outdoor temperature 7˚C standard and outdoor temperature goes down by below zero, heating capacity can drop according to temperature condition.
3. Need special load calculation in case of use by main heating in the winter, and please buy product for low temperature that heating effect excels at low temperature.
4. Maximum length between outdoor and indoor units allows up to 200m (Equivalent length 220m).
5. If the indoor unit is below, height length allows up to 110m (If over 50m, decide whether to install the PDM kit). If the outdoor unit is below, allowable height length is 40m.

2-3 Accessory and Option Specifications

2-3-1 Accessories

Picture	Classification	Model Name	Remark
	Y-Joint	MXJ-YA1509M	15.0 kW and below
		MXJ-YA2512M	Over 15.0 kW~40.6 kW and below
		MXJ-YA2812M	Over 40.6 kW~46.4 kW and below
		MXJ-YA2815M	Over 46.4 kW~69.6 kW and below
		MXJ-YA3419M	Over 69.6 kW~98.6 kW and below
		MXJ-YA4119M	Over 98.6 kW~139.2 kW and below
		MXJ-YA4422M	Over 139.2 kW
	Y-Joint (Only H/R)	MXJ-YA1500M	23.2 kW and below
		MXJ-YA2500M	Over 23.2 kW~69.6 kW and below
		MXJ-YA3100M	Over 69.6 kW~139.2 kW and below
		MXJ-YA3800M	139.2 kW and below
	Distribution header	MXJ-HA2512M	46.4 kW and below (for 4 rooms)
		MXJ-HA3115M	69.6 kW and below (for 8 rooms)
		MXJ-HA3819M	Over 69.6 kW (for 8 rooms)
	Y-Joint -Outdoor Unit	MXJ-TA3819M	139.2 kW and below
		MXJ-TA4422M	145 kW and below
	Y-Joint (Only H/R)-Outdoor Unit	MXJ-TA3100M	139.2 kW and below
		MXJ-TA3800M	145 kW and Over
	MCU (Mode Control Unit)	MCU-S6NEE1N	6 ROOM
		MCU-S4NEE1N	4 ROOM
		MCU-S4NEE2N	4 ROOM
	EEV KIT (1 Room)	MEV-E24SA	Applty to products without EEV (Wall mount & Ceiling)
		MEV-E32SA	
	EEV KIT (2 Room)	MXD-E24K132A	
		MXD-E24K200A	
		MXD-E32K200A	
		MXD-E24K232A	
	EEV KIT (3 Room)	MXD-E24K132A	
		MXD-E24K300A	
		MXD-E32K224A	
		MXD-E32K300A	

3. Disassembly and Reassembly

3-1 Necessary Tools

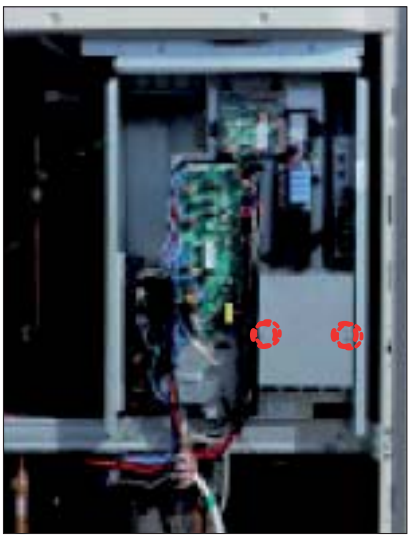
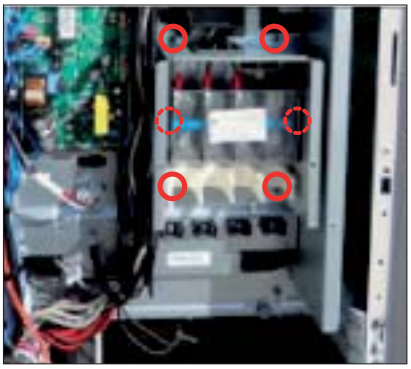
Item	Remark
+SCREW DRIVER	
MONKEY SPANNER	
-SCREW DRIVER	
NIPPER	
ELECTRIC MOTION DRIVER	
L-WRENCH	

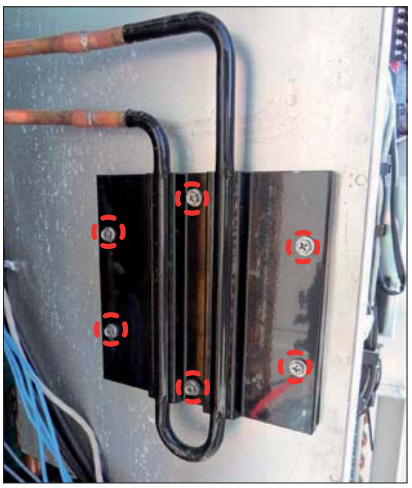
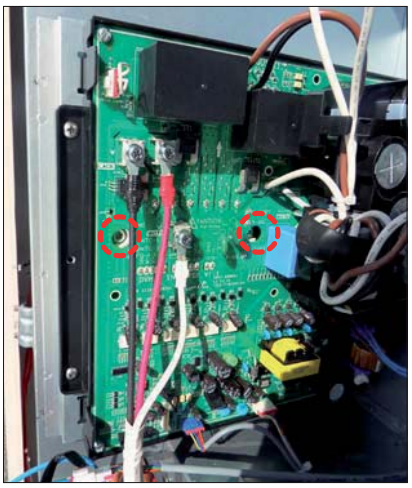
● For "disassembly and assembly" DVM PLUS Ⅳ indoor unit, please refer to the products with the same structures.
Only those products that are not specified elsewhere are described here.

3-2 Disassembly and Reassembly

3-2-1 AM080/100/120FXV✳✳✳

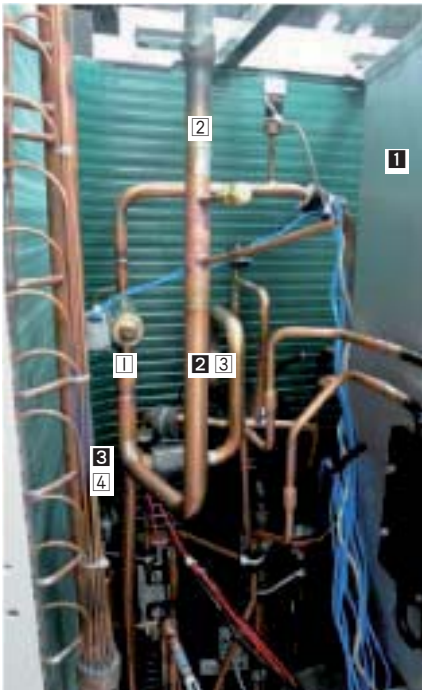
No.	Parts	Procedure	Remark
1	Electrical equipment Part	1) 14 screws that is fixing CABINET remove.(Use + Screw driver)	
		2) Remove 4 screws that is fixing and separate Cover Control Box. (Use + Screw driver)	
		3) Power, Compressor, Valve, Motor, Sensor connector connected to ASSY PCB remove.	

No.	Parts	Procedure	Remark
		4) 2 screws had fixed in terminal block cover when change power terminal block, communication terminal block remove.	
		5) 2 screws had fixed in terminal block after remove 4 screws had fixed to Cabinet for terminal block protection remove.	
		6) 5 screws had fixed to Front part remove.	

No.	Parts	Procedure	Remark
		7) 6 screws had fixed on side refrigerant cooling part outside remove . ⚠ Do not separate Heat Sink pulling Assy Piping Cooling piping compulsorily. (Is responsible for parts damage.)	
		8) 2 screws had fixed on side refrigerant cooling part inside remove.	

Binding Wire 1

■ AM080/100/120FXVAGH

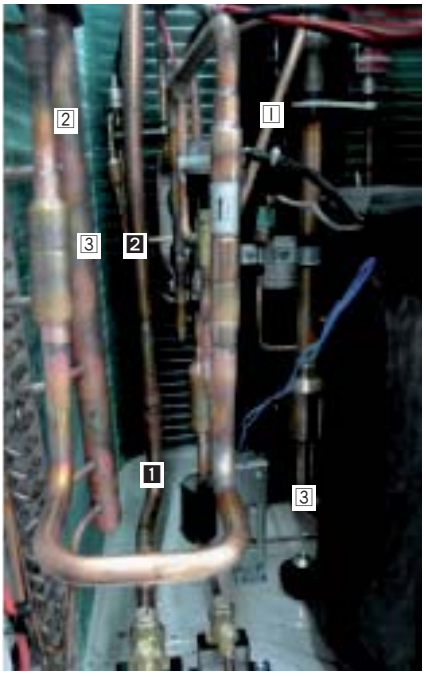


VALVE & SENSOR

No	Valve & Sensor
1	4WAY Valve
2	High Pressure Sensor
3	Suction Sensor
4	EVI Out Sensor

INSULATION

No	Model	Insu Code	Binding Wire
1	AM080/100/120FXVAGH	DB62-04154C	
2	AM080/100/120FXVAGH	DB62-03808B	
3	AM080/100/120FXVAGH	DB62-03808C	



VALVE & SENSOR

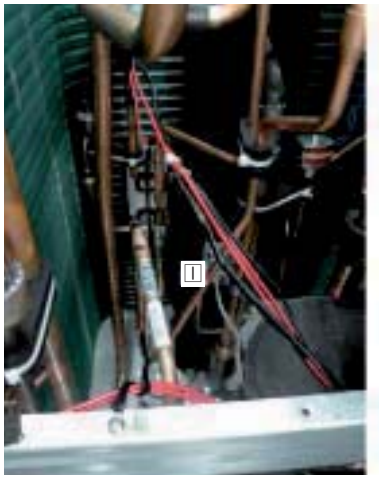
No	Valve & Sensor
1	Expansion Valve
2	EVI EEV Valve
3	Accum Oil Return Valve
4	EVI In Sensor

INSULATION

No	Model	Insu Code	Binding Wire
1	AM080/100/120FXVAGH	DB62-03808C	
2	AM080/100/120FXVAGH	DB62-03808E	

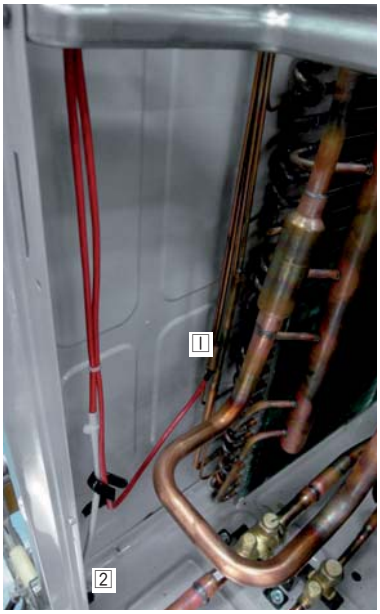
Binding Wire 2

■ AM080/100/120FXVAGH



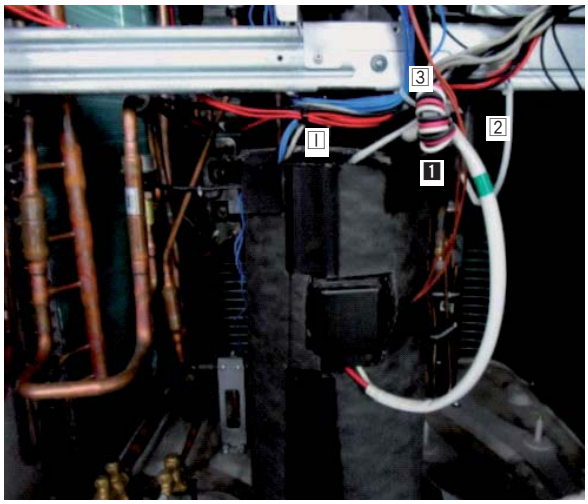
VALVE & SENSOR

No	Valve & Sensor
1	Low Pressure Sensor



VALVE & SENSOR

No	Valve & Sensor
1	Cond Out Sensor
2	Outdoor Temperature Sensor



VALVE & SENSOR

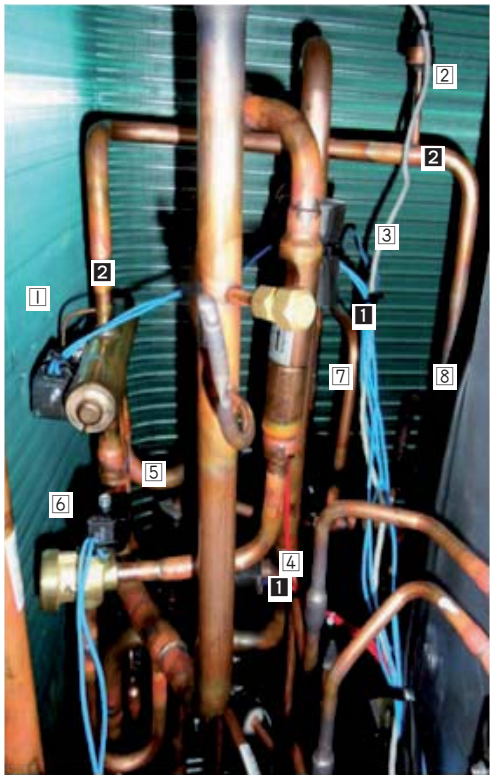
No	Valve & Sensor
1	Comp Top Sensor
2	Discharge Sensor
3	High Pressure Switch

INSULATION

No	Model	Insu Code	Binding Wire
1	AM080/100/120FXVAGH	DB62-03808D	

Binding Wire 1

■ AM080/100/120FXVAGR

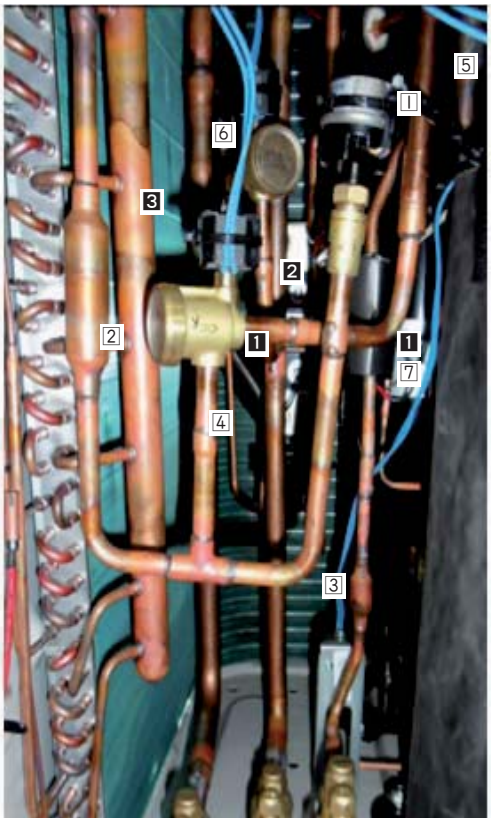


VALVE & SENSOR

No	Valve & Sensor
1	4WAY Valve
2	High Pressure Sensor
3	Suciton 1 Sensor
4	Suciton 2 Sensor
5	EVI Out Sensor
6	Main Cooling Valve
7	EVI Bypass Valve
8	EVI SOL Valve

INSULATION

No	Model	Insu Code	Binding Wire
1	AM080/100/120FXVAGR	DB62-03808B	
	AM120FXVAGR	DB62-03808G	
2	AM080/100/120FXVAGR	DB62-04154B	



VALVE & SENSOR

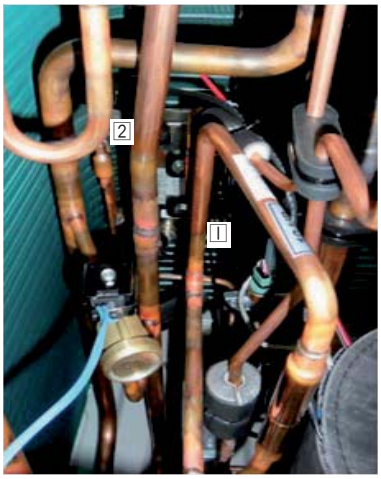
No	Valve & Sensor
1	Main EEV Valve
2	OD EEV Valve
3	Accum Return Valve
4	EVI In Sensor
5	Hot Gas 1 Valve
6	Hot Gas 2 Valve
7	Liquid Sensor

INSULATION

No	Model	Insu Code	Binding Wire
1	AM080/100/120FXVAGR	DB62-03808E	
2	AM080/100/120FXVAGR	DB62-04154B	
3	AM080/100/120FXVAGR	DB62-03808C	

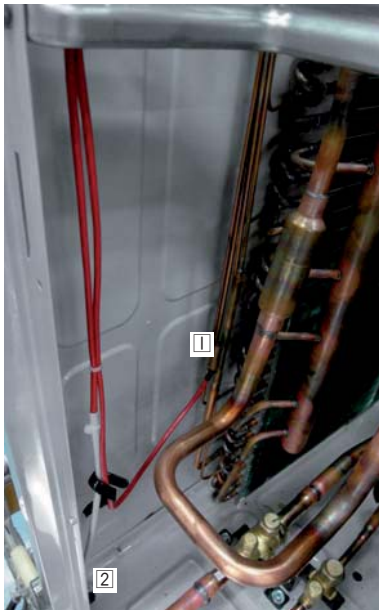
Binding Wire 2

■ AM080/100/120FXVAGR



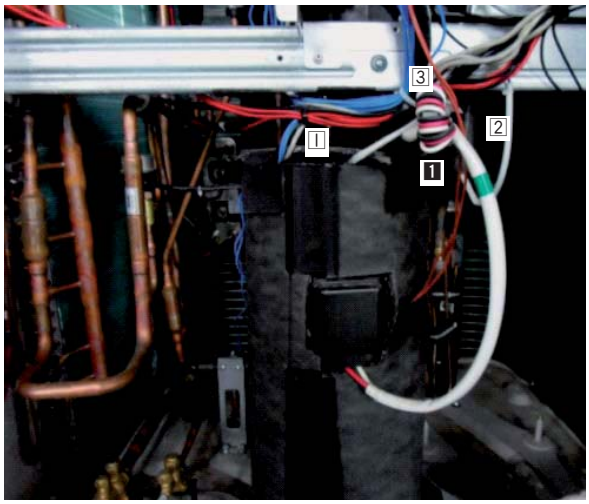
VALVE & SENSOR

No	Valve & Sensor
1	Low Pressure Sensor
2	EVI EEV Valve



VALVE & SENSOR

No	Valve & Sensor
1	Cond Out Sensor
2	Outdoor Temperature Sensor



VALVE & SENSOR

No	Valve & Sensor
1	Comp Top Sensor
2	Discharge Sensor
3	High Pressure Switch

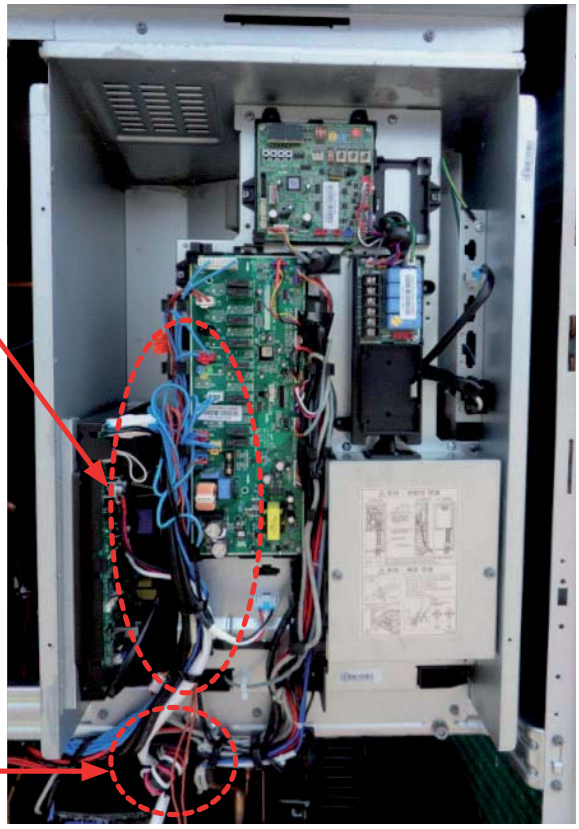
INSULATION

No	Model	Insu Code	Binding Wire
1	AM080/100/120FXVAGH	DB62-03808D	

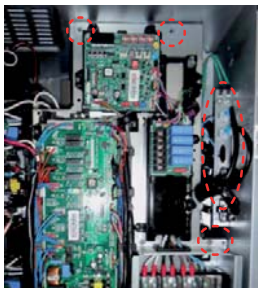
Binding Wire 3

■ AM080/100/120FXV✳✳✳

► Comp Wire fix by Holder Wire.



► Fix Comp Wire-Core to Bracket Beam Control Box using large size Cable Tie(350mm).

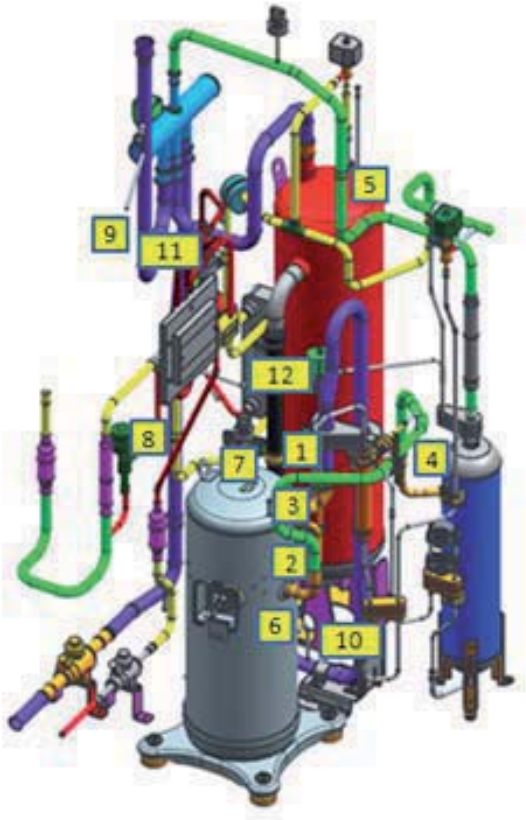
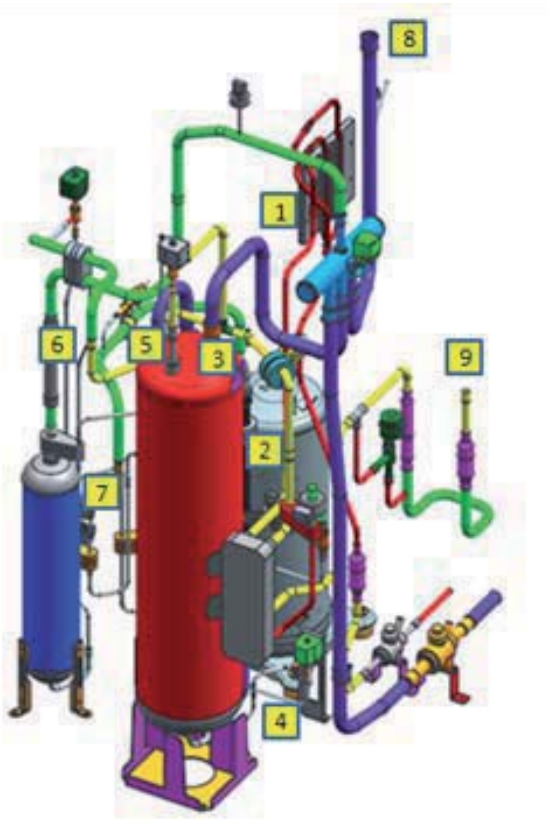


► Separate double layer structure of C/Box after remove 3 screws and connector.

[Reference Sheet]

Pipe Welding Position

■ AM080/100/120FXVAGH/EU

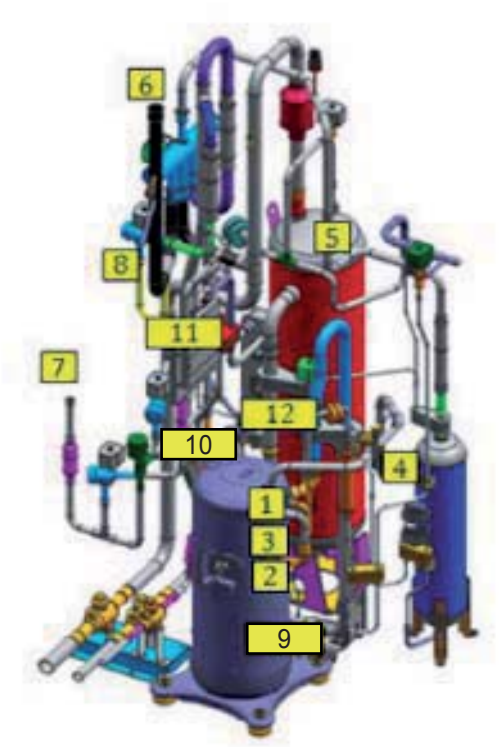
Front Welding Parts	Rear Welding Parts
	

No.	Welding Position	Q'ty	No.	Welding Position	Q'ty
1	Comp+Suction	1	1	Cooling+Subcooler	1
2	Comp+Discharge	1	2	Subcooler+EVI Bypass	1
3	Comp+Vapor Injection	1	3	Accum+4Way	1
4	Discharge+Oil Sepa	1	4	Accum+Accum Oil Vavle	1
5	4Way+Oil Sepa Out	1	5	Accum+EVI Bypass	1
6	Oil Return+Suction	1	6	Vapor Injection+EVI Bypass	1
7	Hot Gas Vavle +Suction	1	7	Hot Gas Vavle +Oil Sepa Out	1
8	Expansion+Subcooler	1	8	4Way+Cond In	
9	Pinch Pipe	1	9	Expansion+Cond Out	
10	Accum Oil Return Valve + Suction	1			
11	Liquid Ball Vavle +Colling	1			
12	Accum+Suction	1			

[Reference Sheet]

Pipe Welding Position

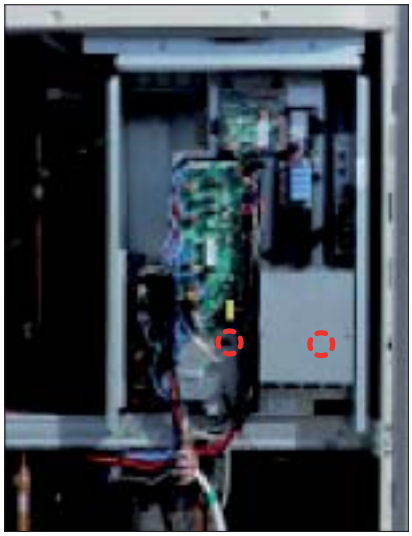
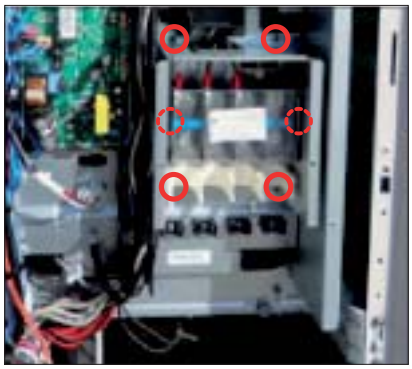
■ AM080/100/120FXVAGR/EU

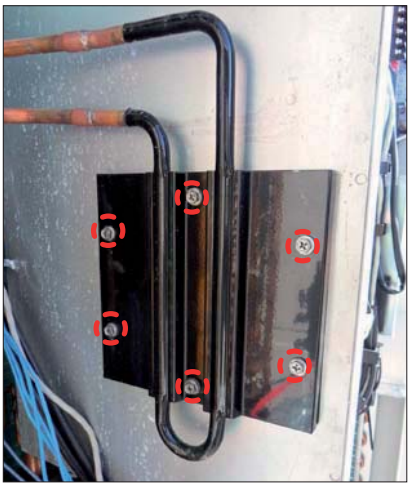
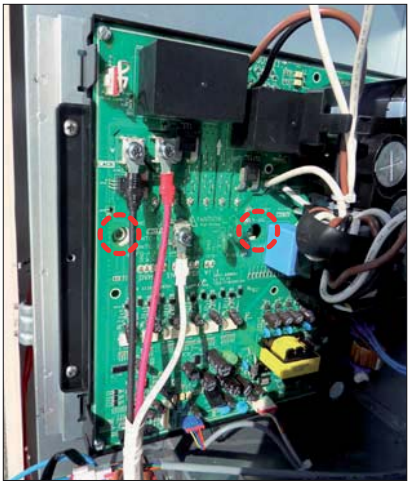
Front Welding Parts	Rear Welding Parts
	

No.	Welding Position	Q'ty	No.	Welding Position	Q'ty
1	Comp+Suction	1	1	Cooling+Subcooler	1
2	Comp+Discharge	1	2	Subcooler+EVI Bypass	1
3	Comp+Vapor Injection	1	3	Accum+4Way	1
4	Discharge+Oil Sepa	1	4	Accum+Accum Oil Vavle	1
5	4Way+Oil Sepa Out	1	5	Accum+EVI Bypass	1
6	4Way+Cond In	1	6	Vapor Injection+EVI Bypass	1
7	Expansion+Cond Out	1	7	Hot Gas Vavle +Oil Sepa Out	1
8	Pinch Pipe	1	8	Oil Return+Suction	
9	Accum Oil Return Valve+Suction	1	9	LQD Ball Valve+Subcooler	
10	Subcooler+Expansion	1			
11	LQD Ball Valve+Cooling	1			
12	Accum+Suction	1			

3-2-2 AM140FXV✳✳✳

No.	Parts	Procedure	Remark
1	Electrical equipment Part	1) 11 screws that is fixing CABINET remove.(Use + Screw driver)	
		2) Remove 4 screws that is fixing and separate Cover Control Box. (Use + Screw driver)	
		3) Power, Compressor, Valve, Motor, Sensor connector connected to ASSY PCB remove.	

No.	Parts	Procedure	Remark
		4) 2 screws had fixed in terminal block cover when change power terminal block, communication terminal block remove.	
		5) 2 screws had fixed in terminal block after remove 4 screws had fixed to Cabinet for terminal block protection remove.	
		6) 5 screws had fixed to Front part remove.	

No.	Parts	Procedure	Remark
		7) 6 screws had fixed on side refrigerant cooling part outside remove . ⚠ Do not separate Heat Sink pulling Assy Piping Cooling piping compulsorily. (Is responsible for parts damage.)	
		8) 2 screws had fixed on side refrigerant cooling part inside remove.	

Binding Wire 1

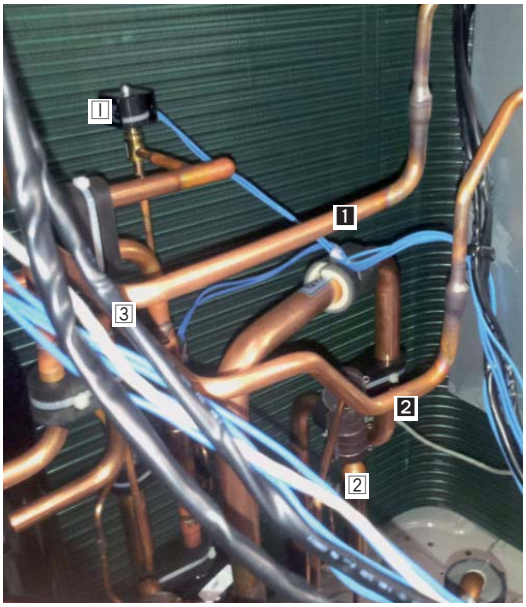
■ AM140FXVAGH

VALVE & SENSOR

No	Valve & Sensor
1	4WAY Valve
2	High Pressure Sensor
3	EVI Bypass Valve

INSULATION

No	Model	Insu Code	Binding Wire
1	AM140FXVAGH	DB62-03808G	



VALVE & SENSOR

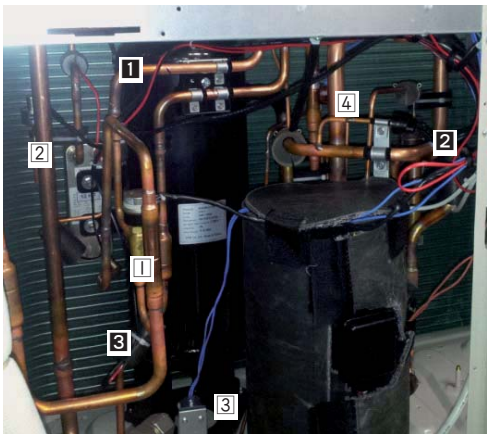
No	Valve & Sensor
1	EVI SOL Valve
2	Low Pressure Sensor
3	Hot Gas Valve

INSULATION

No	Model	Insu Code	Binding Wire
1	AM140FXVAGH	DB62-04154D	
2	AM140FXVAGH	DB62-04154D	

Binding Wire 2

■ AM140FXVAGH

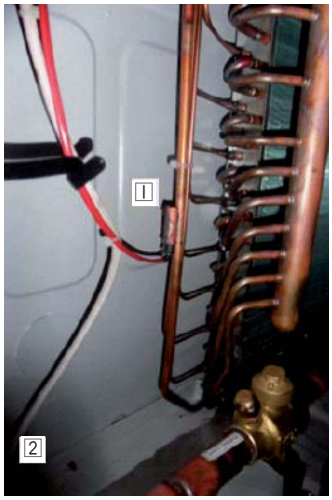


VALVE & SENSOR

No	Valve & Sensor
1	Expansion Valve
2	EVI EEV Valve
3	Accum Oil Return Valve
4	High Pressure Switch

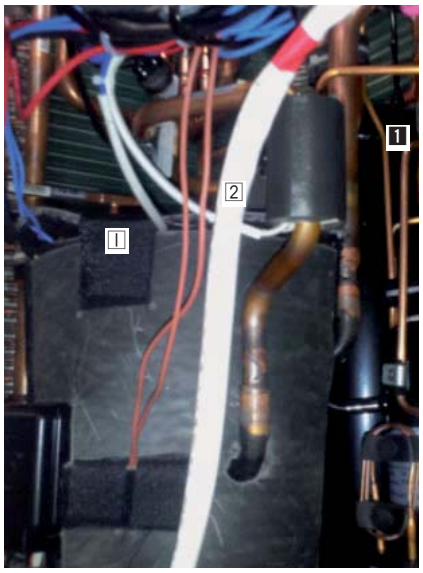
INSULATION

No	Model	Insu Code	Binding Wire
1	AM140FXVAGH	DB62-03808C	
2	AM140FXVAGH	DB62-03808D	
3	AM140FXVAGH	DB62-03808E	



VALVE & SENSOR

No	Valve & Sensor
1	Cond Out Sensor
2	Outdoor Temperature Sensor



VALVE & SENSOR

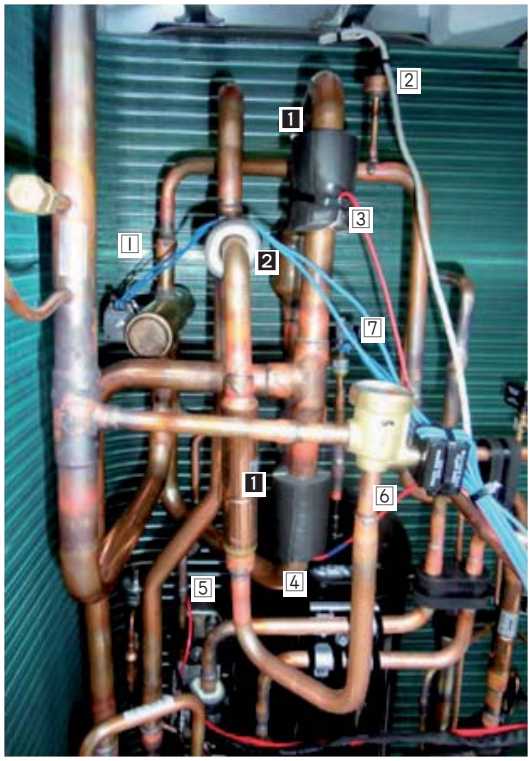
No	Valve & Sensor
1	Comp Top Sensor
2	Discharge Sensor

INSULATION

No	Model	Insu Code	Binding Wire
1	AM140FXVAGH	DB62-03808C	

Binding Wire 1

■ AM140FXVAGR

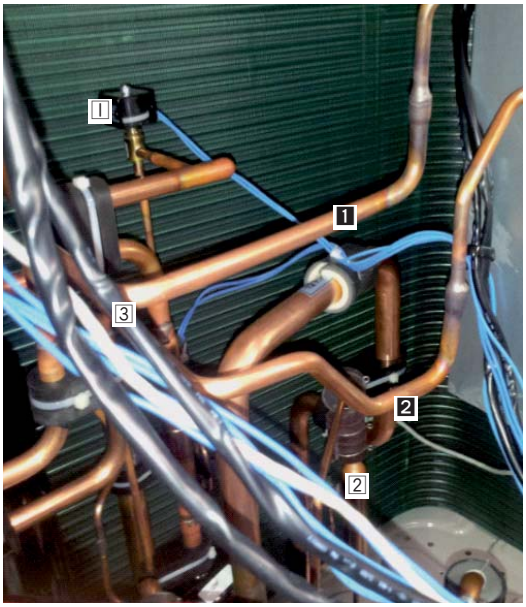


VALVE & SENSOR

No	Valve & Sensor
1	4WAY Valve
2	High Pressure Sensor
3	Suciton 1 Sensor
4	Suciton 2 Sensor
5	EVI Out Sensor
6	Main Cooling Valve
7	EVI Bypass Valve

INSULATION

No	Model	Insu Code	Binding Wire
1	AM140FXVAGR	DB62-03808G	
2	AM140FXVAGR	DB62-04154C	



VALVE & SENSOR

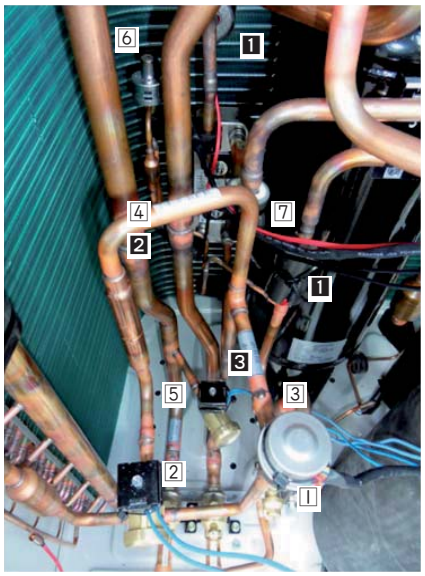
No	Valve & Sensor
1	EVI SOL Valve
2	Low Pressure Sensor
3	Hot Gas Valve

INSULATION

No	Model	Insu Code	Binding Wire
1	AM140FXVAGR	DB62-04154D	
2	AM140FXVAGR	DB62-04154D	

Binding Wire 2

■ AM140FXVAGR



VALVE & SENSOR

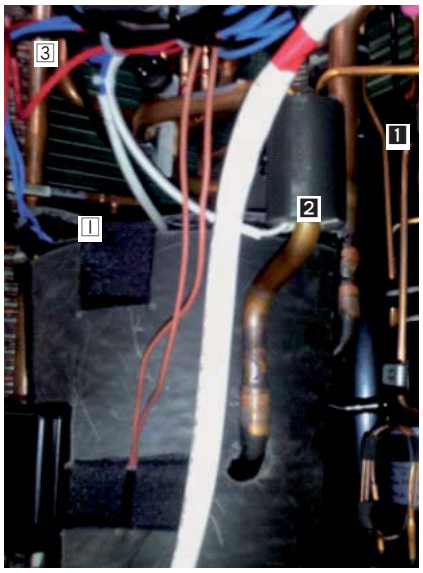
No	Valve & Sensor
1	Main EEV Valve
2	OD EEV Valve
3	Accum Return Valve
4	EVI In Sensor
5	Hot Gas 2 Valve
6	EVI EEV Valve
7	Liquid Sensor

INSULATION

No	Model	Insu Code	Binding Wire
1	AM140FXVAGR	DB62-03808C	
2	AM140FXVAGR	DB62-03808E	
3	AM140FXVAGR	DB62-04154B	

VALVE & SENSOR

No	Valve & Sensor
1	Cond Out Sensor
2	Outdoor Temperature Sensor



VALVE & SENSOR

No	Valve & Sensor
1	Comp Top Sensor
2	Discharge Sensor
3	High Pressure Switch

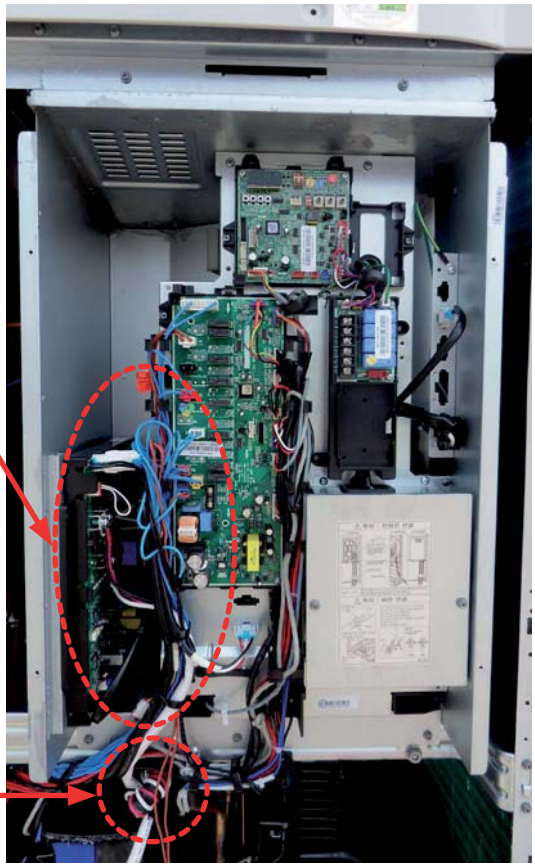
INSULATION

No	Model	Insu Code	Binding Wire
1	AM140FXVAGR	DB62-03808C	
2	AM140FXVAGR	DB62-03808D	

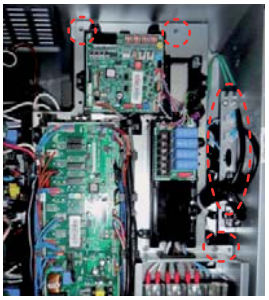
Binding Wire 3

■ AM140FXV✳✳✳

► Comp Wire fix by Holder Wire.



► Fix Comp Wire-Core to Bracket Beam Control Box using large size Cable Tie(350mm).

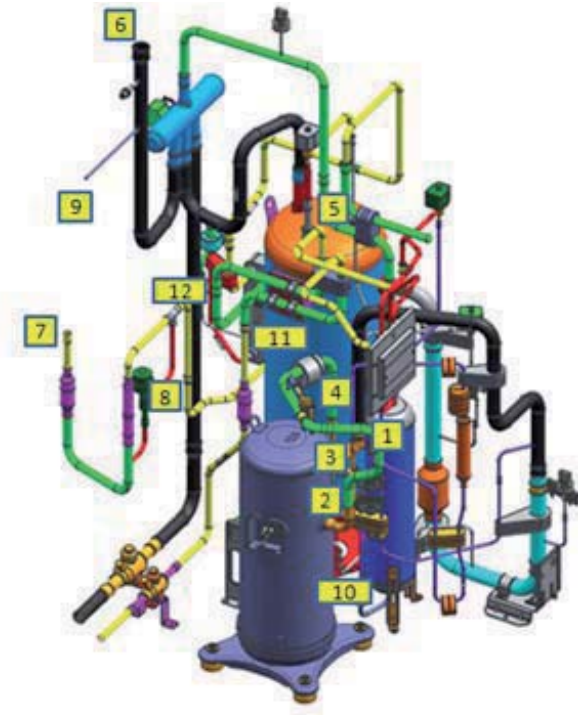
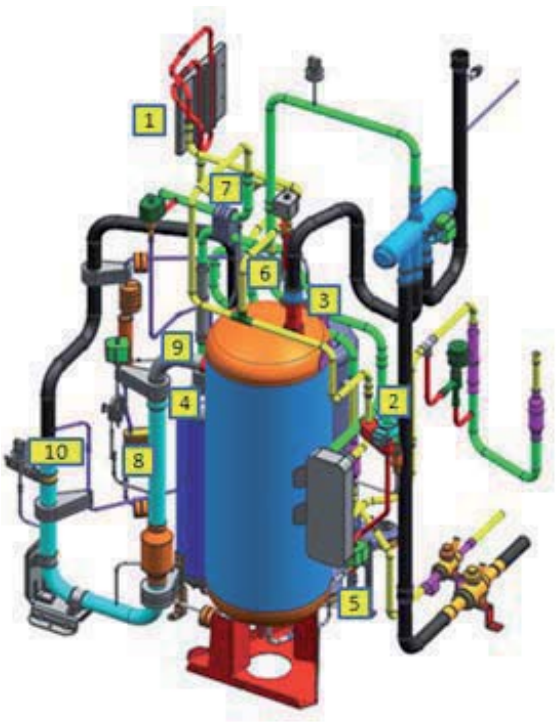


► Separate double layer structure of C/Box after remove 3 screws and connector.

[Reference Sheet]

Pipe Welding Position

■ AM140FXVAGH/EU

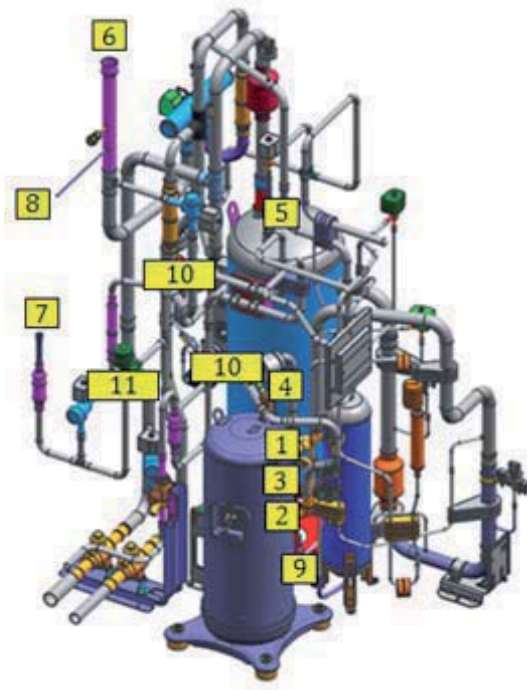
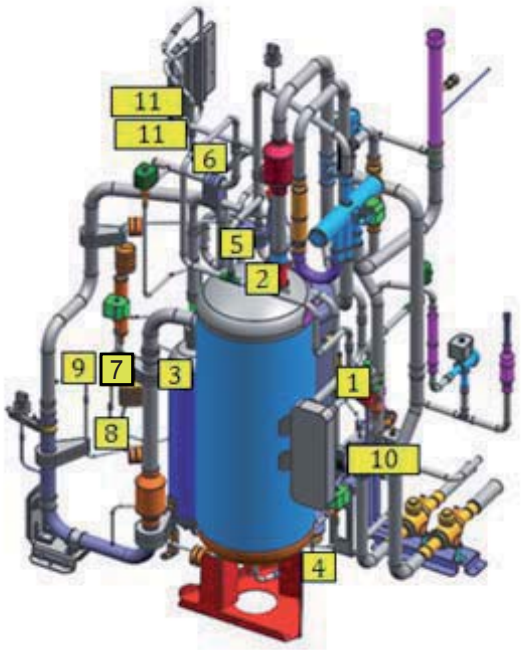
Front Welding Parts	Rear Welding Parts
	

No.	Welding Position	Q'ty	No.	Welding Position	Q'ty
1	Comp+Suction	1	1	Cooling+Subcooler In	2
2	Comp+Discharge	1	2	Subcooler+EVI Bypass	1
3	Comp+Vapor Injection	1	3	Accum+4Way	1
4	Discharge+Oil Sepa	1	4	Accum+Suction	1
5	4Way+Oil Sepa Out	1	5	Accum+Accum Oil Valve	1
6	4Way+Cond In	1	6	Accum+EVI Bypass	1
7	Expansion+Cond Out	1	7	Vapor Injection+EVI Bypass	1
8	Expansion+Subcooler	1	8	Hot Gas Valve+Suction	1
9	Pinch Pipe	1	9	Hot Gas Valve+Oil Sepa Out	1
10	Accum Oil Return Valve + Suction	1	10	Oil Return+Suction	1
11	Liquid Ball Valve+Subcooler In	1			
12	Subcooler+Subcooler In	1			

[Reference Sheet]

Pipe Welding Position

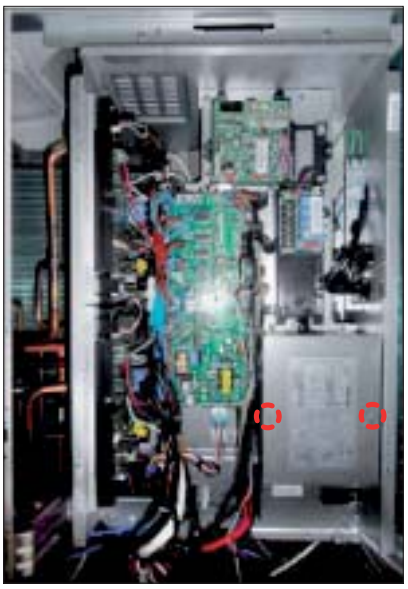
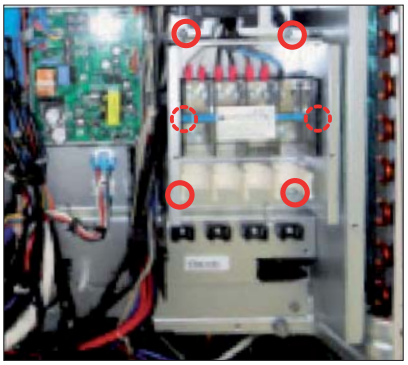
■ AM140FXVAGR/EU

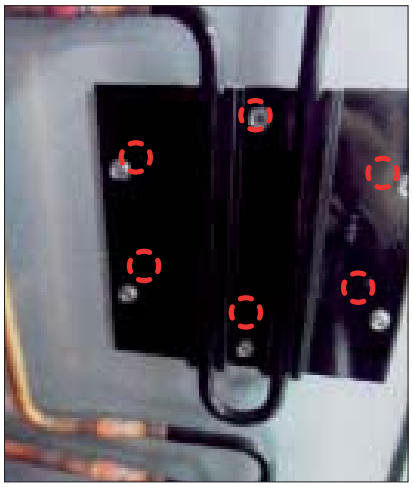
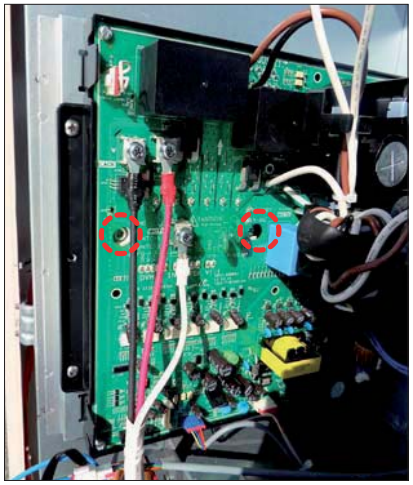
Front Welding Parts	Rear Welding Parts
	

No.	Welding Position	Q'ty	No.	Welding Position	Q'ty
1	Comp+Suction	1	1	Subcooler+EVI Bypass	1
2	Comp+Discharge	1	2	Accum+4Way	1
3	Comp+Vapor Injection	1	3	Accum+Suction	1
4	Discharge+Oil Sepa	1	4	Accum+Accum Oil Valve	1
5	4Way+Oil Sepa Out	1	5	Accum+EVI Bypass	1
6	4Way+Cond In	1	6	Vapor Injection+EVI Bypass	1
7	Expansion+Cond Out	1	7	Hot Gas Valve+Suction	1
8	Pinch Pipe	1	8	Hot Gas Valve+Oil Sepa Out	1
9	Accum Oil Return Valve+Suction	1	9	Oil Return+Suction	1
10	Subcooler+Subcooler In	1	10	LQD Valve+Subcooler In	1
11	Expansion+Subcooler	1	11	Cooling+Subcooler In	2
12	LQD Ball Valve+Subcooler In	1			

3-2-3 AM160/180/200/220FXV✳✳✳

No.	Parts	Procedure	Remark
1	Electrical equipment Part	1) 11 screws that is fixing CABINET remove.(Use + Screw driver)	
		2) Remove 4 screws that is fixing and separate Cover Control Box. (Use + Screw driver)	
		3) Power, Compressor, Valve, Motor, Sensor connector connected to ASSY PCB remove.	

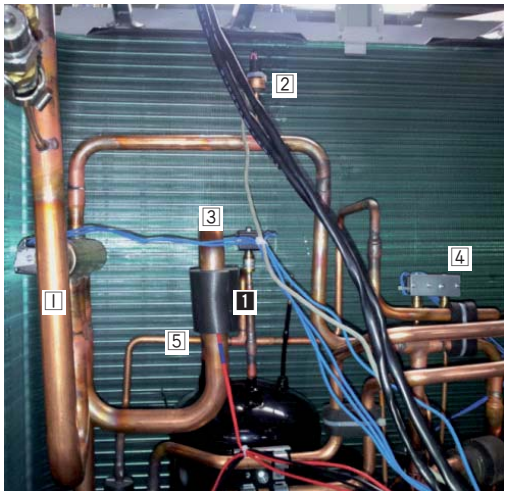
No.	Parts	Procedure	Remark
		4) 2 screws had fixed in terminal block cover when change power terminal block, communication terminal block remove.	
		5) 2 screws had fixed in terminal block after remove 4 screws had fixed to Cabinet for terminal block protection remove.	
		6) 5 screws had fixed to Front part remove.	

No.	Parts	Procedure	Remark
		7) 6 screws had fixed on side refrigerant cooling part outside remove . ⚠ Do not separate Heat Sink pulling Assy Piping Cooling piping compulsorily. (Is responsible for parts damage.)	
		8) 2 screws had fixed on side refrigerant cooling part inside remove.	

No.	Parts	Procedure	Remark
	< Reference > Heat Sink	To Heat Sink Thermal Grease Spread service work - Spread enough Thermal Grease evenly on Plate Heat Sink back whole using roller or brush. - Reassemble Plate Heat Sink in reverse order of disassembly.	

Binding Wire 1

■ AM160/180/200/220FXVAGH

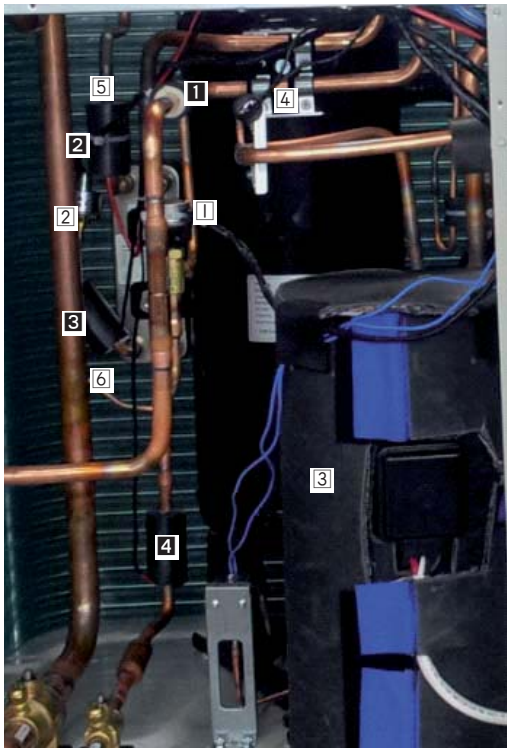


VALVE & SENSOR

No	Valve & Sensor
1	4WAY Valve
2	High Pressure Sensor
3	EVI Bypass Valve
4	EVI SOL Valve
5	Suction Sensor

INSULATION

No	Model	Insu Code	Binding Wire
1	AM160/180/200/220FXVAGH	DB62-03808A	



VALVE & SENSOR

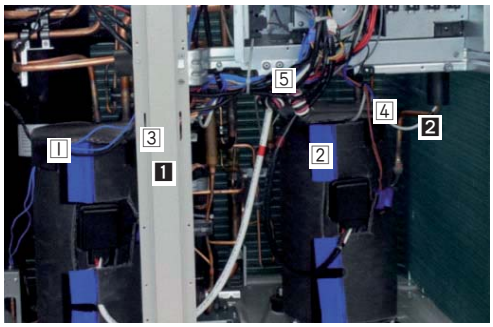
No	Valve & Sensor
1	Expansion Valve
2	EVI EEV Valve
3	Accum Oil Return Valve
4	High Pressure Switch #1
5	EVI Out Sensor
6	EVI In Sensor

INSULATION

No	Model	Insu Code	Binding Wire
1	AM160/180/200/220FXVAGH	DB62-04154B	
2	AM160/180/200/220FXVAGH	DB62-03808D	
3	AM160/180/200/220FXVAGH	DB62-03808E	
4	AM160/180/200/220FXVAGH	DB62-03808C	

Binding Wire 2

■ AM160/180/200/220FXVAGH

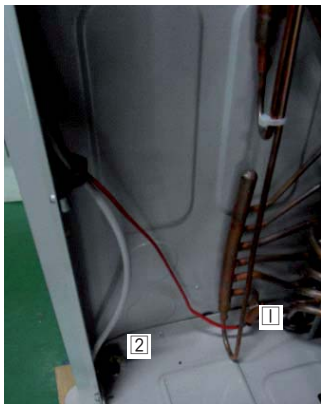


VALVE & SENSOR

No	Valve & Sensor
1	Comp Top #1 Sensor
2	Comp Top #1 Sensor
3	Discharge #1 Sensor
4	Discharge #2 Sensor
5	High Pressure Switch #2

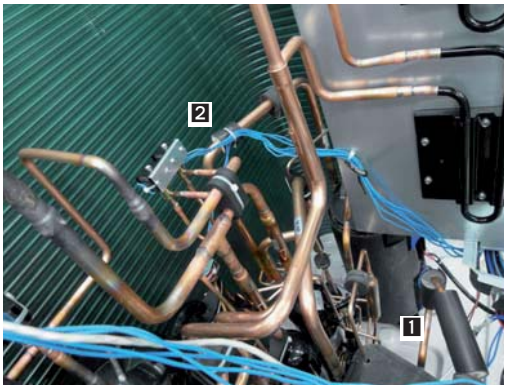
INSULATION

No	Model	Insu Code	Binding Wire
1	AM160/180/200/220FXVAGH	DB62-03808A	
	AM160/180/200/220FXVAGH	DB62-03808D	
2	AM160/180/200/220FXVAGH	DB62-03808C	
	AM160/180/200/220FXVAGH	DB62-03808D	



VALVE & SENSOR

No	Valve & Sensor
1	Cond Out Sensor
2	Outdoor Temperature Sensor

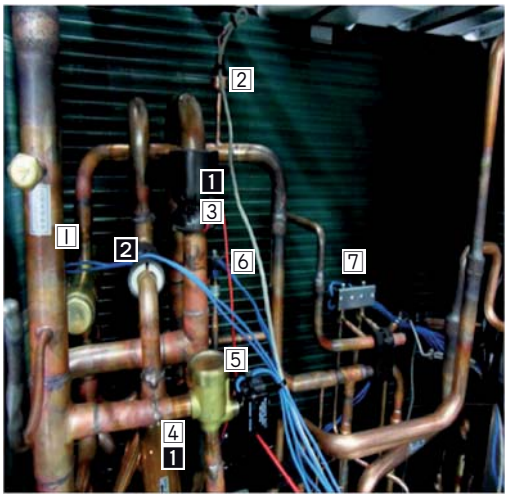


INSULATION

No	Model	Insu Code	Binding Wire
1	AM160/180/200/220FXVAGH	DB62-04154J	
2	AAM160/180/200/220FXVAGH	DB62-04154C	

Binding Wire 1

■ AM160/180/200/220FXVAGR

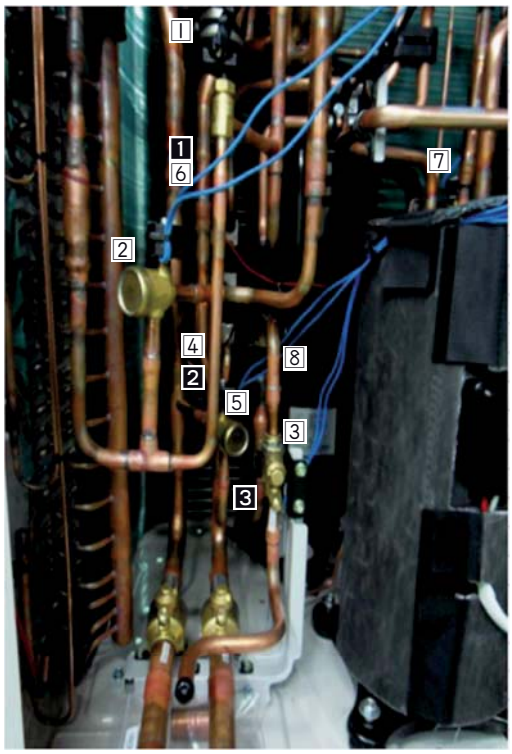


VALVE & SENSOR

No	Valve & Sensor
1	4WAY Valve
2	High Pressure Sensor
3	Suciton 1 Sensor
4	Suciton 2 Sensor
5	Main Cooling Valve
6	EVI Bypass Valve
7	EVI SOL Valve

INSULATION

No	Model	Insu Code	Binding Wire
1	AM160/180/200/220FXVAGR	DB62-03808A	
2	AM160/180/200/220FXVAGR	DB62-04154C	



VALVE & SENSOR

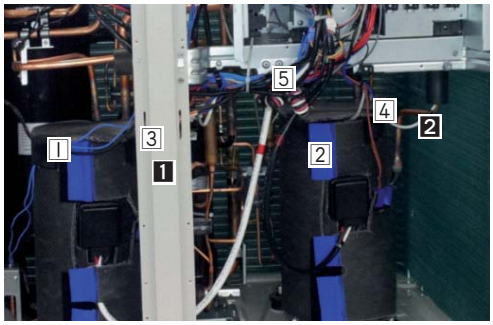
No	Valve & Sensor
1	Main EEV Valve
2	OD EEV Valve
3	ARV Valve
4	EVI In Sensor
5	Hot Gas 2 Valve
6	EVI Out Sensor
7	Hot Gas 1 Valve
8	Liquid Sensor

INSULATION

No	Model	Insu Code	Binding Wire
1	AM160/180/200/220FXVAGR	DB62-03808C	
2	AM160/180/200/220FXVAGR	DB62-03808E	
3	AM180/200/220FXVAGR	DB62-03808D	
	AM160FXVAGR	DB62-03808C	

Binding Wire 2

■ AM160/180/200/220FXVAGR

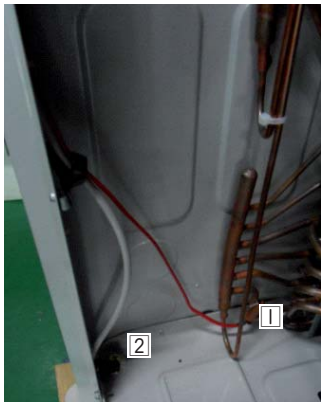


VALVE & SENSOR

No	Valve & Sensor
1	Comp Top #1 Sensor
2	Comp Top #1 Sensor
3	Discharge #1 Sensor
4	Discharge #2 Sensor
5	High Pressure Switch #2

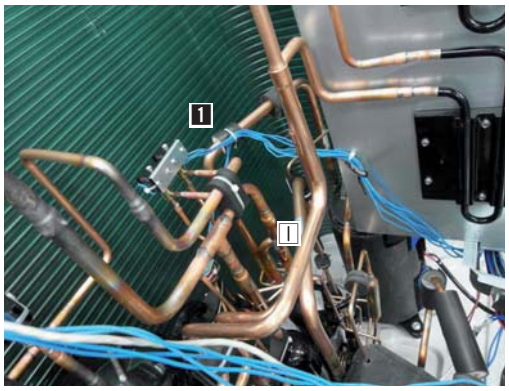
INSULATION

No	Model	Insu Code	Binding Wire
1	AM200/220FXVAGR	DB62-03808D	
	AM160/180FXVAGR	DB62-03808C	
2	AM180/200/220FXVAGR	DB62-03808D	
	AM160FXVAGR	DB62-03808C	



VALVE & SENSOR

No	Valve & Sensor
1	Cond Out Sensor
2	Outdoor Temperature Sensor



VALVE & SENSOR

No	Valve & Sensor
1	Low Pressure Sensor

INSULATION

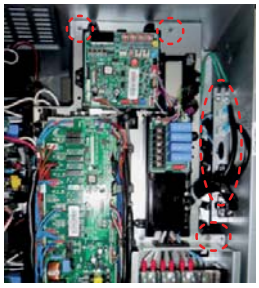
No	Model	Insu Code	Binding Wire
1	AM160/180/200/220FXVAGR	DB62-04154C	

Binding Wire 3

■ AM160/180/200/220FXVAGH

► Comp Wire fix by Holder Wire.

► Fix Comp Wire-Core to Bracket Beam Control Box using large size Cable Tie(350mm).

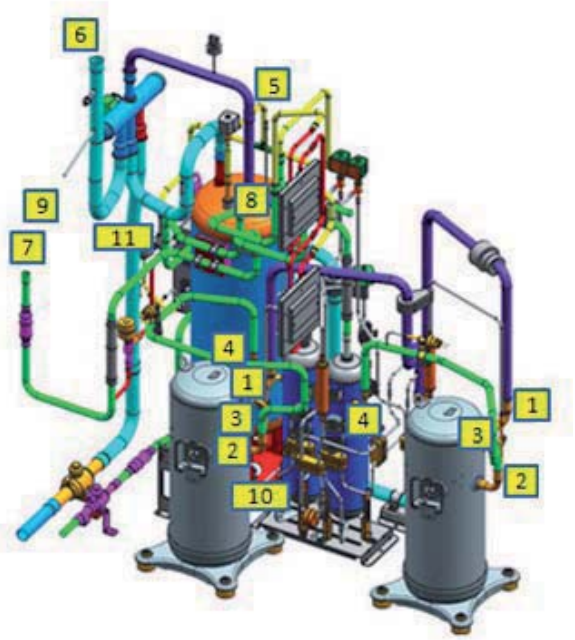


► Separate double layer structure of C/Box after remove 3 screws and connector.

[Reference Sheet]

Pipe Welding Position 4

■ AM160/180/200/220FXVAGH/EU

Front Welding Parts	Rear Welding Parts
	

No.	Welding Position	Q'ty	No.	Welding Position	Q'ty
1	Comp+Suction	2	1	Cooling+Subcooler In	1
2	Comp+Discharge	2	2	Subcooler+EVI Bypass	1
3	Comp+Vapor Injection	2	3	Accum+4Way	1
4	Discharge+Oil Sepa	2	4	Accum+Suction	1
5	4Way+Oil Sepa Out	1	5	Accum+Accum Oil Vavle	1
6	4Way+Cond In	1	6	Accum+EVI Bypass	1
7	Expansion+Cond Out	1	7	Vapor Injection+EVI Bypass	1
8	Expansion+Cooling	1	8	Hot Gas Vavle +Suction	1
9	Pinch Pipe	1	9	Hot Gas Vavle +Oil Sepa Out	1
10	Accum Oil Return Valve + Suction	1	10	Oil Return+Suction	2
11	Subcooler+Subcooler In	1			

[Reference Sheet]

Pipe Welding Position 4

■ AM160/180/200/220FXVAGR/EU

Front Welding Parts	Rear Welding Parts

No.	Welding Position	Q'ty	No.	Welding Position	Q'ty
1	Comp+Suction	2	1	Cooling+Subcooler In	2
2	Comp+Discharge	2	2	Subcooler+EVI Bypass	1
3	Comp+Vapor Injection	2	3	Accum+4Way	1
4	Discharge+Oil Sepa	2	4	Accum+Suction	1
5	4Way+Oil Sepa Out	1	5	Accum+Accum Oil Vavle	1
6	4Way+Cond In	1	6	Accum+EVI Bypass	1
7	Expansion+Cond Out	1	7	Vapor Injection+EVI Bypass	1
8	Pinch Pipe	1	8	Hot Gas Vavle +Suction	1
9	Accum Oil Return Valve+Suction	1	9	Hot Gas Vavle +Oil Sepa Out	1
10	Subcooler+Expansion	1	10	Oil Return+Suction	2
			11	LQD Ball Valve+Subcooler	1

3-3 Caution at compressor exchange

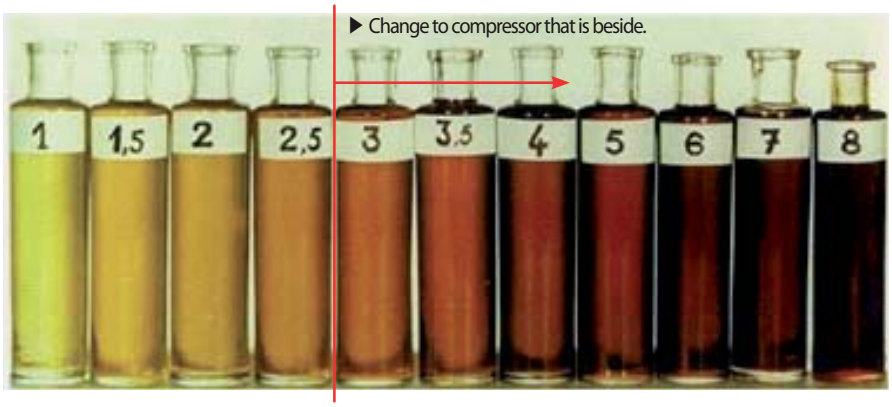
■ Compressor exchange order

STEP	Occasion that compressor is 1 inside outdoor unit	Occasion that compressor is 2 inside outdoor unit
1	-	Establish compressor to exchange by cutting.
2	-	Refrigerant release driving of applied outdoor unit ※ Refrigerant release driving enforces 1th necessarily. Release driving that enforce contiguously can be responsible for compressor breakdown.
3	Lock all SVC valve of liquid pipe and gas pipe.	
4	Enter in vacuum mode and establish as all EEV and Valve open.	
5	Reclaim refrigerant of outdoor unit using Recovery Unit. ※ When there is no Recovery Unit, refer to below contents. 1. If refrigerant release driving is enforced, refrigerant remaining amount of outdoor unit inside is about 1.5kg ordinarily. Temperature can remain more refrigerant because refrigerant fills to Accumulator in the winter day. 2. Refer to factory charging refrigerant had registered to Label of outdoor unit. 3. Can get help that decide an addition refrigerant quantity if use refrigerant quantity decision function that use S-Checker.	
6	Turn off the power linked by outdoor unit.	
7	Separate compressor that broke down from outdoor unit. ※ Confirm through manifold gauge whether refrigerant of outdoor unit was reclaimed all necessarily before use welding machine for replace of compressor.	
8	Measure quantity of broke down oil of compressor.	
9	Confirm state and color of compressor oil that broke down.	
10	-	When is judged that oil was polluted, compressor beside (ASTM : more than 3) measures quantity of replace and oil.
11	Decide quantity of oil to pour in addition according to sheep of changing oil of compressors.	
12	Change by new compressor. Add oil according to sheep of oil that pour decided addition before.	
13	Establish again by vacuum mode after connect power.	
14	Execute leakage examination using nitrogen → vacuum work	
15	Add a refrigerant quantity deciding from step 5.	
16	Execute Auto Trial Operation after open SVC Valve.	

■ Point to consider at compressor exchange

1) Oil color decision (availability of that change compressor that is beside at the same time) of compressor that broke down.

- Decide that exchange all 2 that exchange side that broke down after judge state of oil by below photograph color extracting oil in compressor that broke down in case of exchange compressor.
- ASTM = exchange all 2 more than 3.



- Normalcy Clamping force of bolt that fix compressor is 3 ± 0.5 N-m.

2) Weight of compressor and quantity of oil

- When compressor is shipped at factory, oil of (compressor unit standard) 1100cc was filled up.
- GB052FAVA of weight of compressor including oil is 31.6kg, and GB066FAVA is 35.4kg.
- Add oil to outdoor unit as much as relevant weight if is heavy than weight of compressor that weight of compressor that is changed to locality is changed newly.
- Quantity(kg) of added oil = Weight(kg) of compressor that broke down - Weight(kg) of newly change compressor
- If quantity of calculated addition oil passes over 1kg, quantity of add oil does by 1kg.
- Problem of that is blocked in oil circulation of (remaining oil of compressor that broke down below 0.3kg) compressor if is light more than 0.8kg than weight of compressor that weight of compressor that is changed to locality is changed newly inspects oil circulating system because possibility occurred is high.

3) Checking of oil circulating system

① Oil separator capillary tube or filter of block

- If filter or capillary tube of oil separator lower column is blocked by alien substance etc.., can become cause of compressor breakdown because oil is not collected.
- Can doubt that is blocked if oil separator capillary tube temperature is low after refrigerant outlet temperature of compressor, in driving, rises.

(※ Compressor 2 individual occasion oil separator capillary tubes each other cross.)

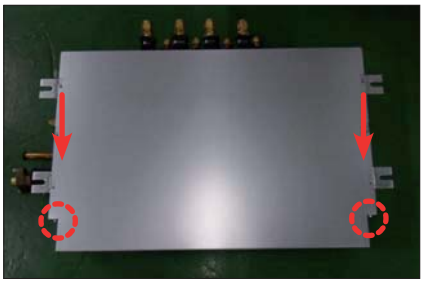
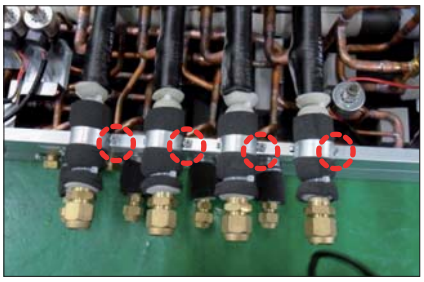
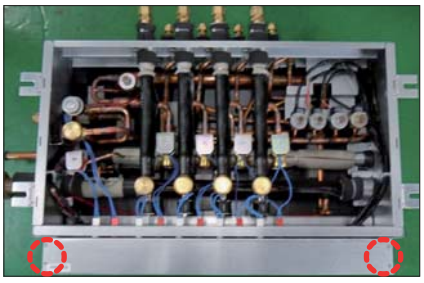
- Confirm that is blocked in stationary state through nitrogen pressurization availability.

② Breakdown of Accum Oil Return Valve (ARV)

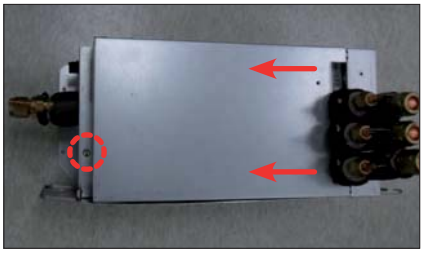
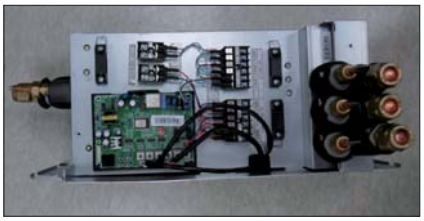
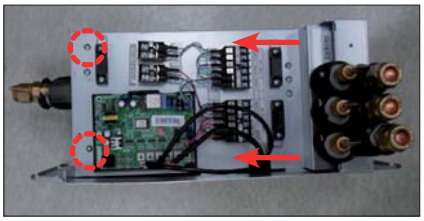
- Damage can become cause of compressor breakdown because oil is not collected if filter of valve front/piping etc.. is blocked with ARV is closed.
- Power connector of ARV confirms that was linked right.
- Extract connector in vacuum mode or confirm whether when insert, action sound of valve happens.

③ When CCH is badness, can become cause of compressor breakdown by oil foaming.

3-4 MCU

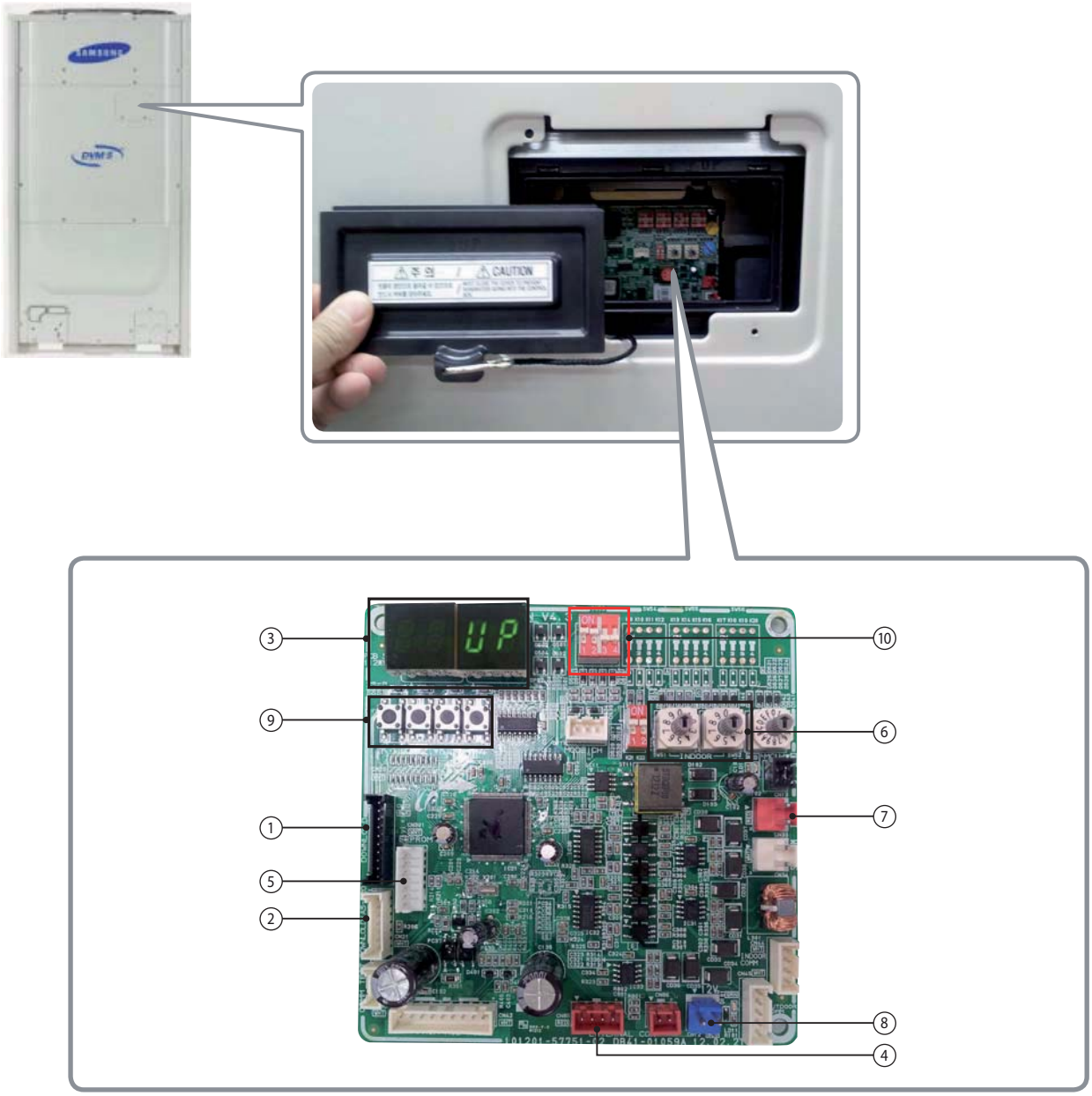
No	Parts	Procedure	Remark
1	Cabinet upper	1) Separate 2 fixing screws from the cabinet. (Use + Serew Driver) 2) Separate cabinet from MCU.	
2	Cabinet front	1) Separate 4 fixing screws from the cabinet. (Use + Serew Driver) 2) Separate 4 fixing screws from the brackets. (Use + Serew Driver)	 
3	Cabinet front	1) Separate front cabinet from MCU.	
4	Control box cover	1) Separate 2 fixing screws from the control box cover. (Use + Serew Driver) 2) Separate control box cover from MCU.	

3-5 EEV KIT

No	Parts	Procedure	Remark
1	Cabinet front	1) Separate 1 fixing screw from EEV kit. (Use + Serew Driver)	
		2) Separate cabinet from EEV kit.	
2	Control parts	1) Separate 2 fixing screws from EEV kit. (Use + Serew Driver)	
		2) Separate control part from EEV kit.	

4. Troubleshooting

4-1 Check-up Window Description



No.	Function	No.	Function
1	CN22 download (PC) (SMW200-10 black)	6	Set up the number of connected outdoor units
2	MICOM. download (AS-PRO) (SMW200-07P white)	7	For checking indoor unit communication (YW396-02P red)
3	ERROR DISPLAY	8	Transmitter 12V (YW396-02P blue)
4	State Check (SMW250-04P red)	9	Outdoor Unit Tact Switch
5	EEPROM SOCKET	10	Outdoor Unit Dip Switch

4-2. Service Operation

4-2-1 Special Operation

► Key input of the outdoor unit when the service enters the operation mode.

K1 (Number of press)	Key operation	Display on segment
1 time	Refrigerant charging in Heating mode	K, 1, BLANK, BLANK
2 times	Trial operation in Heating mode	K, 2, BLANK, BLANK
3 times	Pump out in Heating mode (Outdoor unit address 1)	K, 3, BLANK, 1
4 times	Pump out in Heating mode (Outdoor unit address 2)	K, 3, BLANK, 2
5 times	Pump out in Heating mode (Outdoor unit address 3)	K, 3, BLANK, 3
6 times	Pump out in Heating mode (Outdoor unit address 4)	K, 3, BLANK, 4
7 times	Vacuumig (Outdoor unit address 1)	K, 4, BLANK, 1
8 times	Vacuumig (Outdoor unit address 2)	K, 4, BLANK, 2
9 times	Vacuumig (Outdoor unit address 3)	K, 4, BLANK, 3
10 times	Vacuumig (Outdoor unit address 4)	K, 4, BLANK, 4
11 times	Vacuuming (All outdoor units)	K, 4, BLANK, A
12 times	End Key operation	-
Press and hold 1 time	Auto Trial Operation	K, K, BLANK, BLANK

K2 (Number of press)	Key operation	Display on segment
1 time	Refrigerant charging in Cooling mode	K, 5, BLANK, BLANK
2 times	Trial operation in Cooling mode	K, 6, BLANK, BLANK
3 times	Pump down all units in Cooling mode	K, 7, BLANK, BLANK
4 times	H/R: Checking the pipe connection H/P: Automatic setting of operation mode (Cooling/Heating) for trail operation	K, 8, BLANK, BLANK
5 times	Checking the amount of refrigerant	"K""9" X X (Display of last two digits may differ depending on the progress)
6 times	Discharge mode of DC link voltage	K, A, BLANK, BLANK
7 times	Forced defrost operation	K, B, BLANK, BLANK
8 times	Forced oil collection	K, C, BLANK, BLANK
9 times	Inverter compressor 1 check	K, D, BLANK, BLANK
10 times	Inverter compressor 2 check	K, E, BLANK, BLANK
11 times	Fan 1 check	K, F, BLANK, BLANK
12 times	Fan 2 check	K, G, BLANK, BLANK
13 times	End Key operation	-

※ Inv1 & Inv2 voltage during discharge mode are displayed alternately.

※ Outdoor Power Off even when the Inverter PCB, Fan PCB is a high DC voltage charging contacts at danger.

※ When you run the repair and replacement of the PCB should work after the power is turned off, the DC voltage discharge.
(Natural discharge until Please wait for at least 15 minutes.)

※ If an error occurs, the discharge mode may not work properly.
In particular, E464 & E364 is power devices can be damaged.
Therefore, the discharge mode, do not use. (Natural discharge until Please wait for at least 15 minutes.)

■ Auto Trial Operation

► After initial installation, stable operation for a certain period of time limited to operation conditions.

	Cooling	Heating
Method of Entry	K2 Tact Switch twice	K1 Tact Switch twice
Compressor	Normal operation, but the maximum frequency limit (differ by model)	
Indoor Unit	Whole operation (The set temperature=3˚C)	Whole operation (The set temperature=40˚C)
Outdoor fan and valves	Normally control conduct	
Operation time	Min : 60 minutes, Max : 10 hours	
Etc.	· Exceed the maximum operating time at stops and waits. · Protection and control, self-diagnosis is performed.	

■ Refrigerant filling operation

► Operation to filling the refrigerant compressor was fixed at a certain frequency.

	Cooling	Heating
Method of Entry	K2 Tact Switch one time	K1 Tact Switch one time
Compressor	Starting frequency (Mild Start frequency) operation	
Indoor Unit	Whole operation (The set temperature=3˚C)	Whole operation (The set temperature=40˚C)
Outdoor fan and valves	Normally control conduct	
Operation time	60 minutes	
Etc.	During the filling operation does not enter the special operation, such as oil recovery, defrost.	

■ Heating Pump Out

► Operation for the repair of the Individual outdoor unit, the outdoor unit refrigerant emissions to the indoor part.
► Liquid pipe service valve and the gas pipe service valve operation, the operator manually need to close.

► Observe low pressure using View Mode of K4 button if compressor operate.
If low pressure goes down below about 0.2 MPa.g : Immediately lock the gas side service valve, Pump Out operation is shut down.
(Pump out operation shut down : K1 button once more press or K3 button one time press)
► If operation of low pressure goes down below 0.1 MPa.g : Will be stopped automatically for the protection of the compressor.

How to Initiate	K1 Tact Switch 3 times~6 times
Compressor	60Hz
Indoor Unit	Whole Operation (The set temperature=40℃)
4Way Valve	ON (Heating Mode)
Outdoor Fan	Maximum air flow
Main EEV	Operation side : 700 Step (Stop side : 0 step)
Maximum Operation Time	10 minutes
Protection Control	Conduct the discharge temperature, high pressure control. (Low pressure protection control is not carried out) ※ Low pressure is outside normal limits : Operation is shut down after gas pipe manually closed.
Etc.	Entry after safety start. (Only the corresponding Outdoor Unit operation.) To pump out more than 2 : Except communication between Outdoor Unit of relevant set after working for one, remainder set makes Pump Out add.

■ Cooling Pump Down

► Recover the refrigerant of Indoor Unit and Piping to outdoor side.
► Liquid pipe service valve and the gas pipe service valve operation, the operator manually need to close.
► If the installation of the long pipe : Any refrigerant into the outdoor unit can not be recovered, therefore should use a separate container.
► Observe low pressure using View Mode of K4 button if compressor operate.
If low pressure goes down below about 0.2 MPa.g : Immediately lock the gas side service valve, Pump Out operation is shut down.
(Pump out operation shut down : K1 button once more press or K3 button one time press)
► If operation of low pressure goes down below 0.1 MPa.g : Will be stopped automatically for the protection of the compressor.

How to Initiate	K2 Tact Switch 3 times
Compressor	Address No.1 Outdoor Unit - 60Hz (Other Outdoor Unit COMP OFF)
Indoor Unit	Whole Operation (The set temperature=3℃)
4Way Valve	OFF (Cooling Mode)
Outdoor Fan	Maximum air flow
Main EEV	Operation side : 2000 Step , Stop side : 2000 step
Maximum Operation Time	30 minutes
Etc.	Does not conduct the operation of the special operation, and protection control. Pressure and temperature is outside normal limits : Operation is shut down after gas pipe manually closed.

■ Vacuum Operation

► Operation to facilitate vacuum to open the valve after the Outdoor Unit repair.

How to Initiate	K1 Tact Switch 7 times~11 times
Compressor	OFF
Indoor Unit/Outdoor Fan	OFF
4Way Valve	OFF
Valves	Open all valves maximum
Etc.	If not turn off the vacuum mode, the start of normal operation is prohibited.

■ Piping Inspection Operation

► Operation mode to check the status of the piping between the MCU and the indoor unit.

► Heat Pump Model : Outdoor temperature is more than 15℃ / Cooling Auto Trial Operation start
Outdoor temperature is less than 15℃ / Heating Auto Trial Operation start

■ Discharge Mode Operation

► Outdoor power is turned off, the Inverter PCB and Fan PCB charging a high DC voltage, so dangerous to touch.
- To replace the PCB, first turn off the power and the begin if DC voltage is discharged.
- If not use the discharge mode, the discharge time of about 15 minutes takes.
- If an error occurs, the discharge mode may not properly run. (Wait until natural discharge.)
- In particular, E 464, E364, power devices may be damaged, therefore do not use the discharge mode.
(Natural discharge until Please wait for at least 15 minutes.)

► Block the Inverter PCB 3-phase relay after connected the power, and through compressor, DC voltage is discharging.
- INV1 and INV2 DC voltage during discharge mode are displayed alternately.
- Discharge mode Display (Rotate the three page display, as shown below.)
'K' 'A' ' ' ' '→DC Link Volt1 (For example, 120[V] 0 1 2 0 display)
→DCLinkVolt2 (For example, 120[V] 0 1 2 0 display)→'K' 'A' ' ' ' '→DC Link Volt1 …

► Discharge is complete, the power of the Inverter PCB and Fan PCB is being blocked, communication function is blocked, E206 will occur.

► If want operation again after complete discharge mode : Restart after K3 key to Reset or Power Reset.

■ Forced defrost operation

► Forced defrost operation : Is operation when Frost Formation occurs in the outdoor. (When carried out the service)

Method of Entry	K2 Tact Switch 7 times
Start pattern	Heating Trial Operation pattern
Defrost start	Defrost start : It is after 10 minutes which Safety Start finishes.
Defrost off	General defrost operation conditions are the same as.
Etc.	Defrost shut down and stop the normal pattern of the outdoor unit stop.

■ Forced oil recovery operation

► Forced oil recovery operation : Oil recovery in the outdoor unit for the purpose of moving, installation if necessary.

Method of Entry	K2 Tact Switch 8 times
Start pattern	Outdoor temperature is more than 10℃ : Cooling Auto Trial Operation Outdoor temperature is less than or equal to 10℃ : Heating Auto Trial Operation
Oil recovery start	Oil recovery start : It is after 10 minutes which Safety Start finishes.
Etc.	Oil recovery shut down and stop the normal pattern of the outdoor unit stop.

4-2-2 DVM S Models EEPROM Code Table

No.	Model Name	EEP Code
1	AM080FXVAGH/EU	DB82-01358A
2	AM100FXVAGH/EU	DB82-01359A
3	AM120FXVAGH/EU	DB82-01360A
4	AM140FXVAGH/EU	DB82-01361A
5	AM160FXVAGH/EU	DB82-01362A
6	AM180FXVAGH/EU	DB82-01363A
7	AM200FXVAGH/EU	DB82-01364A
8	AM220FXVAGH/EU	DB82-01365A
9	AM080FXVAGR/EU	DB82-01330A
10	AM100FXVAGR/EU	DB82-01331A
11	AM120FXVAGR/EU	DB82-01332A
12	AM140FXVAGR/EU	DB82-01333A
13	AM160FXVAGR/EU	DB82-01334A
14	AM180FXVAGR/EU	DB82-01335A
15	AM200FXVAGR/EU	DB82-01336A
16	AM220FXVAGR/EU	DB82-01337A

4-2-3 Number Display Method (Outdoor Unit, MCU, Cable remote control, wall-mount, etc.)

■ How to Display Integrated Error Code

► Meanings of First Alphabetical Character / Number of Error Code

Displayed alphabet	Explanation	
E	When displaying Error 101~700	
P	When displaying Error 701~800	
C	When E206 occurs	Displays address of subordinate within the set C001 : HUB, C002: FAN, C003: INV1, C004: INV2
	When MCU error occurs	Displays address of MCU Ex) C100: MCU address 0, C101: MCU address 1, C102: MCU address 2
U	When displaying outdoor unit address Ex) U200: Outdoor unit 1, U201: Outdoor unit 2, U202: Outdoor unit 3, U203: Indoor unit 4	
A	When displaying indoor unit address Ex) A000: Indoor unit adress 0, A001: Indoor unit address 1, A002: Indoor unit address 2	

► Order of Error Display

Classification	Error display method	Display Example
Display method for error that occurred in indoor unit	Error Number → Indoor unit address → Error Number, repeat display	E471 → A002 → E471 → A002
Display method for error that occurred in outdoor unit and other methods of error display	Error Number → Outdoor unit address → Error Number, repeat display	E471 → U200 → E471 → U200 E206 → C001 → E206 → C002

■ Diagnosis and Adjustment (Error Code)

► Error code related indoor unit

CODE	Explanation
E-101	Indoor unit communication error. Indoor unit can not receive any data from outdoor unit.
E-102	Communication error between indoor unit and outdoor unit. Displayed in indoor unit.
E-108	Error due to repeated address setting (When 2 or more devices has same address within the network)
E-121	Error on indoor temperature sensor of indoor unit (Short or Open)
E-122	Error on EVA IN sensor of indoor unit (Short or Open)
E-123	Error on EVA OUT sensor of indoor unit (Short or Open)
E-128	EVA IN temperature sensor of indoor unit is detached from EVA IN pipe
E-129	EVA OUT temperature sensor of indoor unit is detached from EVA OUT pipe
E-130	Heat exchanger in/out sensors of indoor unit are detached
E-135	RPM feedback error of indoor unit's cleaning fan
E-149	Error due to AHU master indoor unit sensor setting.
E-151	Error due to opened EEV of indoor unit (2nd detection)
E-152	Error due to closed EEV of indoor unit (2nd detection)
E-153	Error on floating switch of indoor unit (2nd detection)
E-154	RPM feedback error of indoor unit
E-161	Mixed operation mode error of indoor unit; When outdoor unit is getting ready to operate in cooling (or heating) and some of the indoor unit is trying to operate in heating (or cooling) mode
E-162	EEPROM error of MICOM (Physical problem of parts/circuit)
E-163	Indoor unit's remote controller option input is Incorrect or missing. Outdo or unit EEPROM data error
E-180	Simultaneous opening of cooling/heating MCU SOL V/V (1st detection)
E-181	Simultaneous opening of cooling/heating MCU SOL V/V (2nd detection)
E-185	Cross wiring error between communication and power cable of indoor unit
E-186	Connection error or problem on SPi
E-190	No temperature changes in EVA IN during pipe inspection or changes in temperature is seen in indoor unit with wrong address
E-191	No temperature changes in EVA OUT during pipe inspection or changes in temperature is seen in indoor unit with wrong address
E-198	Error due to disconnected thermal fuse of indoor unit

■ Diagnosis and Adjustment (Error Code)

► Error code related to the Communications / Settings / HW (cont.)

Error mode	Cause
E-201	Communication error between indoor and outdoor units (installation number setting error, repeated indoor unit address, indoor unit communication cable error)
E-202	Communication error between indoor and outdoor units (Communication error on all indoor unit, outdoor unit communication cable error)
E-203	Communication error between main and sub outdoor units
E-205	Communication error on all PBA within the outdoor unit C-Box, communication cable error
E-206	E206-C001: HUB PBA communication error / E206-C002: FAN PBA communication errorE206-C003: INV1 PBA communication error / E206-C004: INV2 PBA communication error
E-211	When single indoor unit uses 2 MCU ports that are not in series.
E-212	If the rotary switch (on the MCU) for address setting of the indoor unit has 3 or more of the same address
E-213	When total number of indoor units assigned to MCU is same as actual number of installed indoor units but there is indoor unit that is not installed even though it is assigned on MCU
E-214	When number of MCU is not set correctly on the outdoor unit or when two or more MCU was installed some of them have the same address
E-215	When two different MCU's have same address value on the rotary switch
E-216	When indoor unit is not installed to a MCU port but the switch on the port is set to On.
E-217	hen indoor unit is connected to a MCU port but indoor unit is assigned to a MCU and the switch on the port is set to Off
E-218	When there's at least one or more actual number of indoor unit connection compared to number of indoor units assigned to MCU
E-219	Error on temperature sensor located on MCU intercooler inlet (Short or Open)
E-220	Error on temperature sensor located on MCU intercooler outlet (Short or Open)
E-221	Error on outdoor temperature sensor of outdoor unit (Short or open)
E-231	Error on COND OUT temperature sensor of main outdoor unit (Short or Open)
E-241	COND OUT sensor is detached
E-251	Error on discharge temperature sensor of compressor 1 (Short or Open)
E-257	Error on discharge temperature sensor of compressor 2 (Short or Open)
E-262	Discharge temperature sensor of compressor 1 is detached from the sensor holder on the pipe
E-263	Discharge temperature sensor of compressor 2 is detached from the sensor holder on the pipe
E-266	Top sensor of compressor 1 is detached
E-267	Top sensor of compressor 2 is detached
E-269	Suction temperature sensor is detached from the sensor holder on the pipe
E-276	Error on top sensor of compressor 1 (Short or Open)
E-277	Error on top sensor of compressor 2 (Short or Open)
E-291	Refrigerant leakage or error on high pressure sensor (Short or Open)
E-296	Refrigerant leakage or error on low pressure sensor (Short or Open)
E-308	Error on suction temperature sensor (Short or Open)

■ Diagnosis and Adjustment (Error Code)

► Error code related to the Communications / Settings / HW (cont.)

Error mode	Cause
E-311	Error on temperature sensor of double layer pipe/liquid pipe(sub heat exchanger) (Short or Open)
E-321	Error on EVI (ESC) IN temperature sensor (Short or Open)
E-322	Error on EVI (ESC) OUT temperature sensor (Short or Open)
E-323	Error on suction sensor 2 (Short or Open)
E-346	Error due to operation failure of Fan2
E-347	Motor wire of Fan2 is not connected
E-348	Lock error on Fan2 of outdoor unit
E-353	Error due to overheated motor of outdoor unit's Fan2
E-355	Error due to overheated IPM of Fan2
E-361	Error due to operation failure of inverter compressor 2
E-364	Error due to over-current of inverter compressor 2
E-365	V-limit error of inverter compressor 2
E-366	Error due to over voltage /low voltage of inverter PBA2
E-367	Error due to unconnected wire of compressor 2
E-368	Output current sensor error of inverter PBA2
E-369	DC voltage sensor error of inverter PBA2
E-374	Heat sink temperature sensor error of inverter PBA2
E-378	Error due to overcurrent of Fan2
E-385	Error due to input current of inverter 2
E-386	Over-voltage/low-voltage error of Fan2
E-387	Hall IC connection error of Fan2
E-389	V-limit error on Fan2 of compressor
E-393	Output current sensor error of Fan2
E-396	DC voltage sensor error of Fan2
E-399	Heat sink temperature sensor error of Fan2
E-400	Error due to overheat caused by contact failure on IPM of Inverter PBA2
E-407	Compressor operation stop due to high pressure protection control
E-410	Compressor operation stop due to low pressure protection control or refrigerant leakage
E-416	Compressor operation stop due to discharge temperature protection control
E-425	Phase reversal or phase failure (3Ø outdoor unit wiring, R-S-T-N), connection error on 3 phase input
E-428	Compressor operation stop due abnormal compression ratio
E-438	EVI (ESC) EEV leakage or internal leakage of intercooler or incorrect connector insertion of EVI (ESC) EEV
E-439	Error due to refrigerant leakage
E-440	Heating mode restriction due to high air temperature
E-441	Cooling mode restriction due to low air temperature
E-442	Refrigerant charing restriction in heating mode when air temperature is over 15 ℃
E-443	Operation prohibited due to low pressure
E-445	CCH is deatched
E-446	Error due to operation failure of Fan1
E-447	Motor wire of Fan1 is not connected
E-448	Lock error on Fan1
E-452	Error due to ZPC detection circuit problem or power failure
E-453	Error due to overheated motor of outdoor unit's Fan1

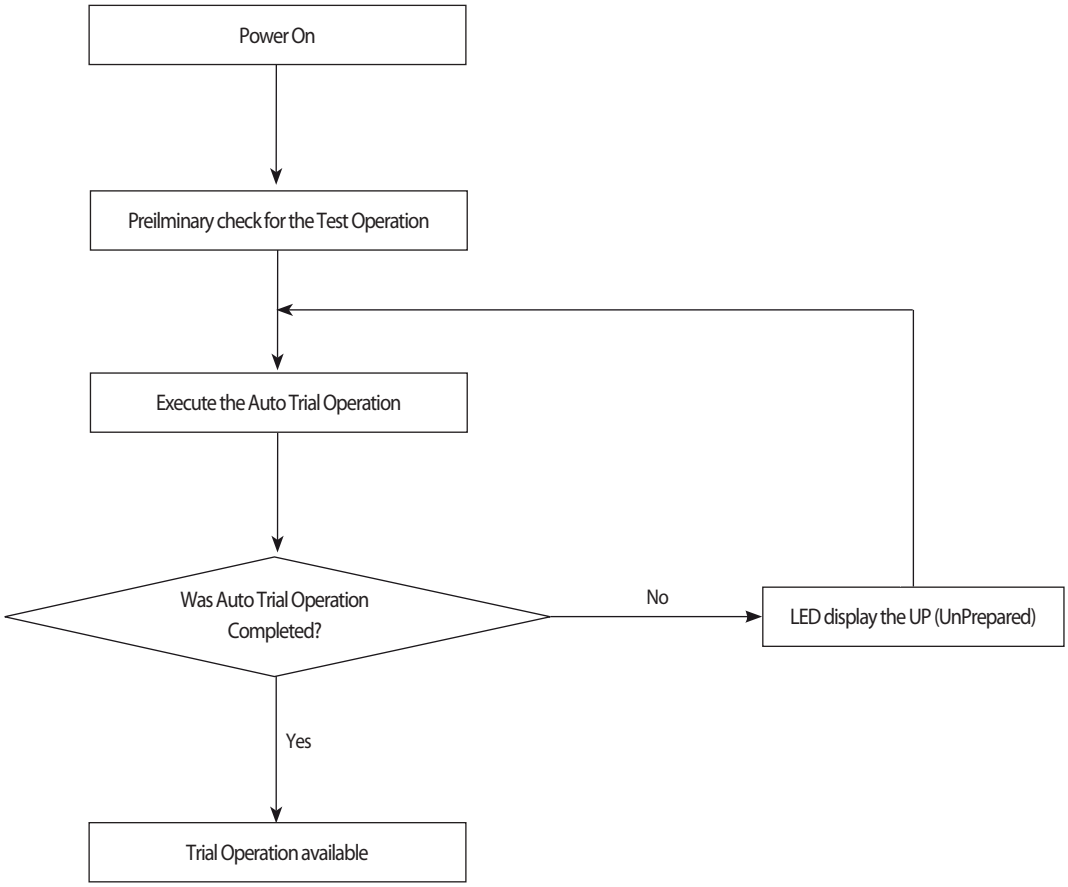
■ Diagnosis and Adjustment (Error Code)

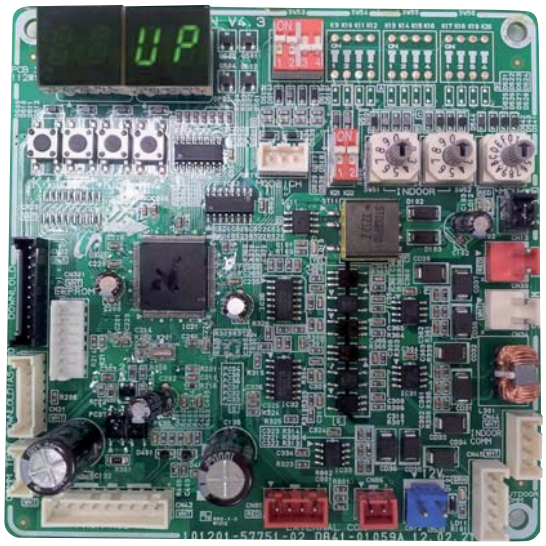
► Error code related to the Communications / Settings / HW (cont.)

Error mode	Cause
E-455	Error due to overheated IPM of Fan1
E-461	Error due to operation failure of inverter compressor 1
E-462	Compressor stop due to full current control or error due to low current on CT2
E-464	Error due to over-current of inverter compressor 1
E-465	V-limit error of inverter compressor 1
E-466	Error due to over voltage /low voltage of inveter PBA1
E-467	Error due to unconnected wire of compressor 1
E-468	Output current sensor error of inverter PBA1
E-469	DC voltage sensor error of inver PBA1
E-474	Heat sink temperature sensor error of inverter PBA1
E-478	Error due to overcurrent of Fan1
E-485	Error due to input current of inverter 1
E-486	Error due to over voltage/low voltage of Fan
E-487	Hall IC error of Fan1
E-489	V-limit error on Fan1 of compressor
E-493	Output current sensor error of Fan1
E-496	DC voltage sensor error of Fan1
E-499	Heat sink temperature sensor error of Fan1
E-500	Error due to overheat caused by contact failure on IPM of Inverter PBA1
E-503	Error due to alert the user to check if the service valve is closed
E-504	Error due to self diagnosis of compressor operation
E-505	Error due to self diagnosis of high pressure sensor
E-506	Error due to self diagnosis of low pressure sensor
E-560	Outdoor unit's option switch setting error (when iinappropriate option switch is on)
E-563	Error due to module installation of indoor unit with old version (Micom version needs to be checked)
E-573	Error due to using single type outdoor unit in a module installation
E-702	Error due to closed EEV of indoor unit (1st detection)
E-703	Error due to opened EEV of indoor unit (1st detection)
UP	Auto Trial Operation incompleted (UnPrepared)

4-3 Appropriate Measures for Different Symptom

4-3-1 Outdoor Unit Test Operation Flow





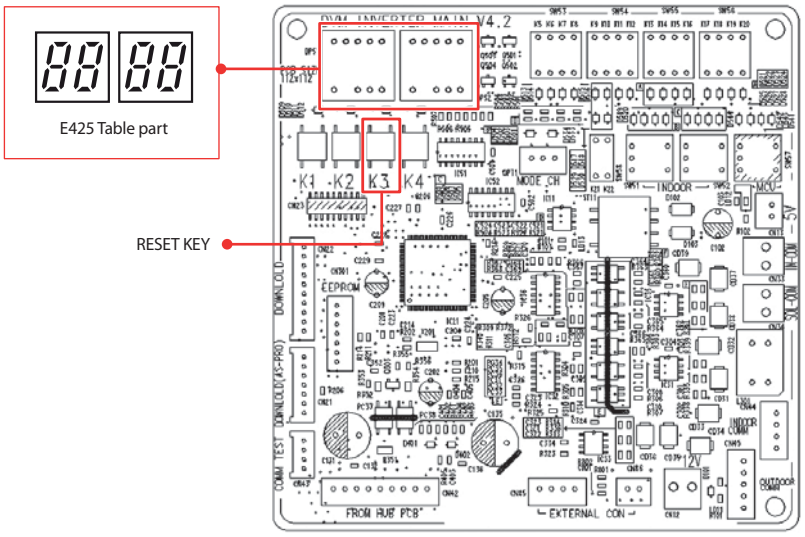
If the Auto Trial Operation is not completed - UP is displyed(UnPrepared)

Prior to starting the air conditioning operation after the initial installation and Auto Trial Operation is carried out. This process, the stable operation to protect the system and verify the defect of the product.

1. Tracking is complete and after the initial installation, if you do not have a history of Auto Trial Operation is completed, UP will be displayed.
2. Execute the Auto Trial Operation by Tact Switch.
3. UP display disappears after Auto Trial Operation is complete, normal operation is possible.
4. Auto Trial Operation is completed, if there is a history, normal operation execution.

■ Reversed Phase/No Phase Check (Outdoor Unit with 3 Phase power) – Display E425 for Problem

1. When the power is on, check the status of the power from the inverter.
   Three-phase L1(R)-L2(S)-L3(T) order, regardless of the power connection on the inverter does not phase power (no phase) can occur.
   In this case, E425 or E466 (E366) is displayed, and then air conditioner will then maintain normal conditions.
   However) N phase must be connected properly.



1) Check the voltage for L1 (R)-L2 (S) phase/L1 (R)-L3 (T) phase/L2 (S)-L3 (T) phase.
2) If there is any terminal without normal voltage, then check the power outside the air conditioner and take the appropriate measures.
3) If the 3-phase voltage is normal, then use the 3-phase tester to display the phase of the power cable.
   Change the power cable connection if reversed phase is displayed.
4) Take the above measures, press the reset key (K3), and then check the power once more.
5) Check the EMI PCB Fuse connection and wiring.
6) If the same problem occurs after another check, check the Inverter PCB.

> **CAUTION**
> ● In case of wiring error (N-phase is changed with one of R, S and T) with the N-phase, will operate the power protection function, display E425 or stop the power. This is not a PCB power defect in this case, before PCB replacement, please check the power on.

■ Initial Tracking (Communication Check-up) - Display E201 for Problem

1. For the display module of the outdoor unit, there are differences in the contents displayed depending on whether the relevant outdoor unit is a master unit or a sub unit.

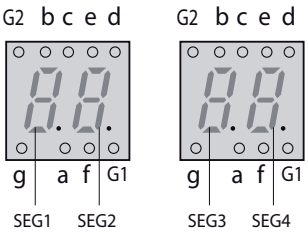
   1) Master Unit

   ● The outdoor unit Micom attempts communication with the indoor unit connected to the communication cable (F1/F2) when the power is turned on.

   ● Basic segment display

Step	Display content	Display			
At initial power input	Checking segment display	SEG1	SEG2	SEG3	SEG4
		"8"	"8"	"8"	"8"
While setting communication between indoor and outdoor unit (Addressing)	Number of connected indoor units	SEG1	SEG2	SEG3, 4	SEG3, 4
		"A"	"d"	Number of communicated units ※ Refer to "View Mode" for communication address	
After communication setting (usual occasion)	Transmit/ Reception address	SEG1	SEG2	SEG3, 4	SEG3, 4
		I/U : "A" MCU : "C"	I/U : "0" MCU : "1"	Reception address (in decimal number)	

※ I/U : Indoor unit



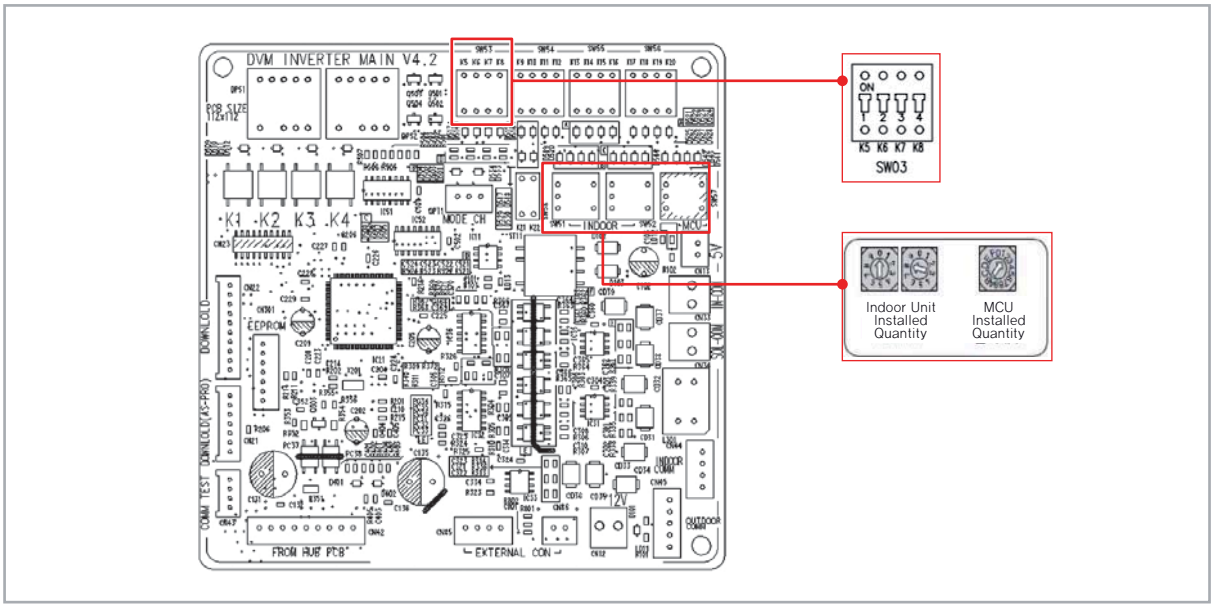
Outdoor Unit Display Parts

   ● If the number of indoor units set by the outdoor unit is not in accordance with the number of indoor units that succeeded with communication, then the four displaying parts will display E201.

   2) Sub(Slave) Unit

   ● The two left hand displays show its own address and the two right hand displays show the outdoor unit's address.
   Main address : C8, Sub1 address : C9, Sub2 address : CA, Sub3 address : CB

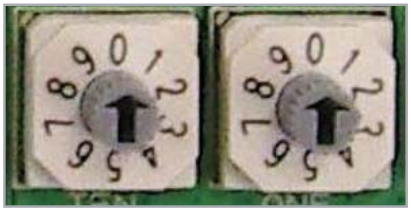
2. The number of the indoor Units Connected to the outdoor unit can be configured by using the indoor unit installation quantity setup switch.



■ Indoor Unit Installation Quantity Setup Switch

The following is an example of how to use the switch according to the number of indoor unit installations. The maximum number of possible indoor unit connections is 64.

3Units Connected		17Units Connected		31Units Connected		64Units Connected	
10's Digit	1's Digit	10's Digit	1's Digit	10's Digit	1's Digit	10's Digit	1's Digit
0	3	1	7	3	1	6	4

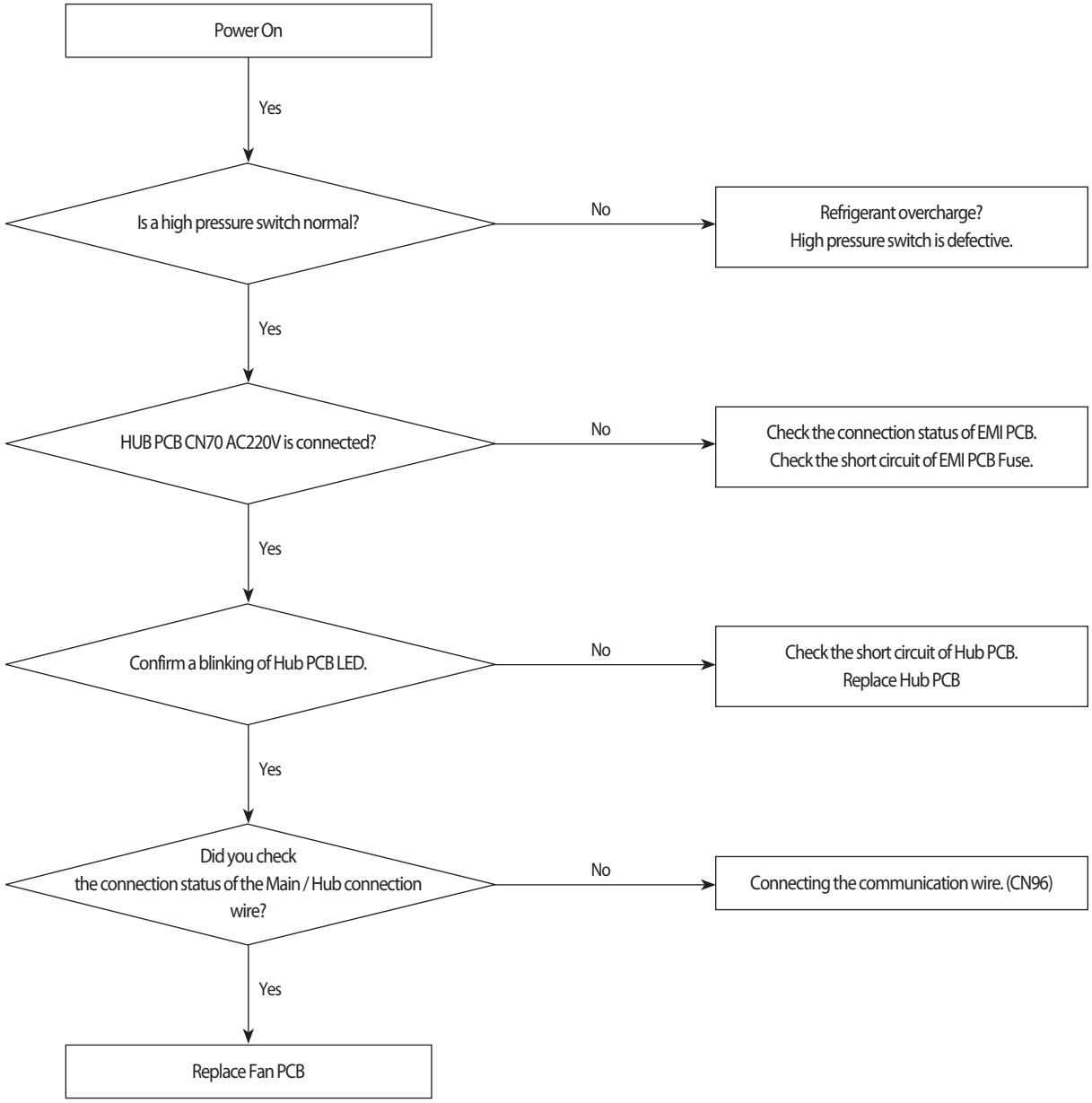

10's Digit (0~9) 1's Digit (0~9)

3. If the quantity of the indoor units configured with the indoor unit installation quantity setup switch does not match the quantity of the indoor units found during the tracking process, E201 and U200 will be displayed in order on the display module.
4. When you install more than one MCU, set the quantity of installed MCU.

4-3-2 Main PCB has no power phenomenon

Outdoor unit display	Main PCB has no power phenomenon (7-seg does not blink)
Judgment Method	Hub PCB power and connection wire to detect.
Cause of problem	· HUB PCB connector wire defects and the connection is not. · Main PCB defective. · Hub PCB defective. · High pressure switch operation

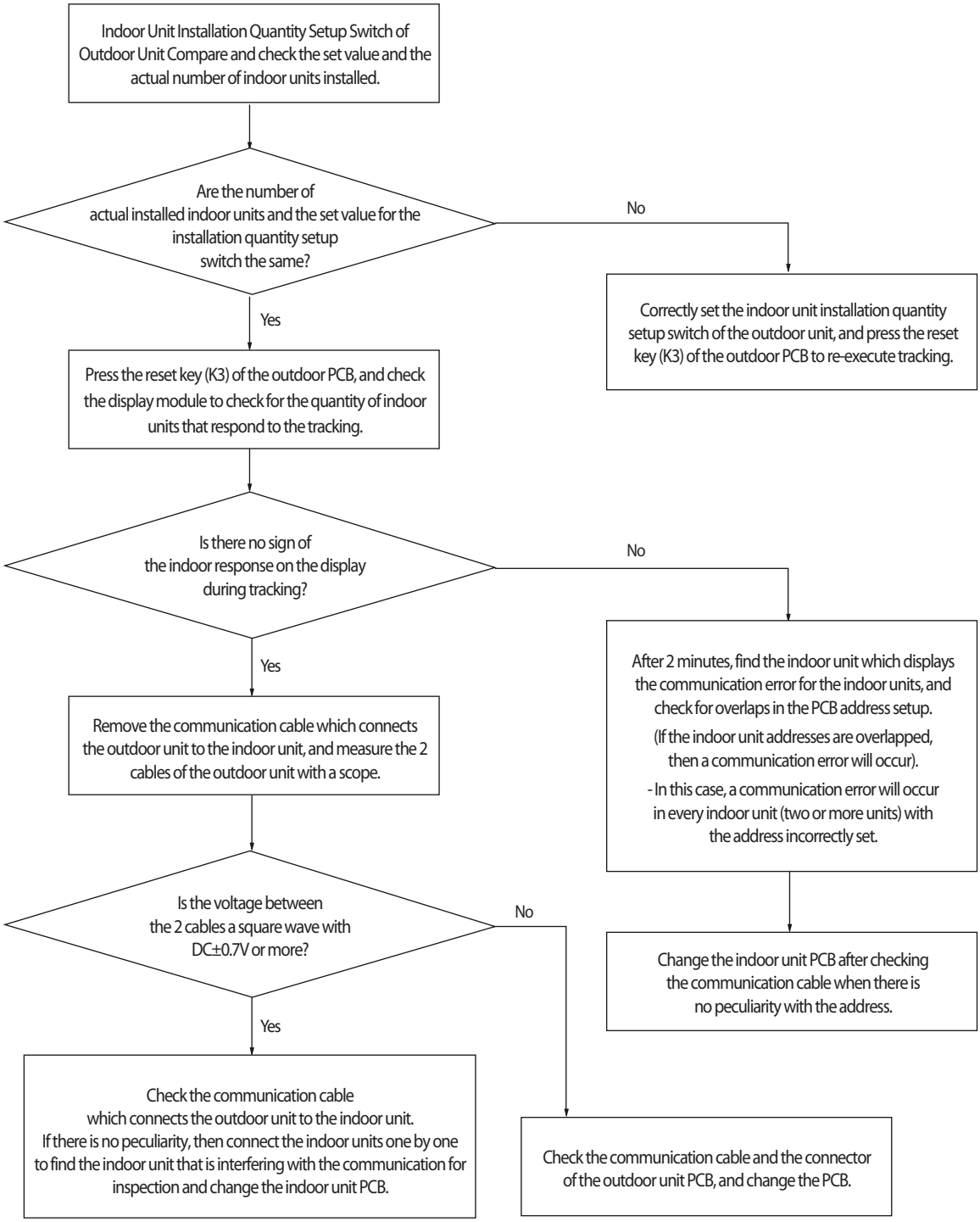
1. Cause of problem



4-3-3 Communication Error between Indoor and Outdoor Units during Tracking

<table>
<tr><td>Outdoor unit display</td><td>E201</td></tr>
<tr><td>Indoorunit display</td><td>
<table>
<tr><td colspan="5">Duct, Cassette (1/2 Way),Console, Celing</td><td colspan="4">Cassette (4/Mini4 Way)</td><td colspan="5">Wall-mounted (NeoForte)</td></tr>
<tr><td>Operation</td><td>Defrost</td><td>Timer</td><td>Fan</td><td>Filter/MPI</td><td>Operation</td><td>Defrost</td><td>Timer</td><td>Filter</td><td>Operation</td><td>Timer</td><td>Turbo</td><td>24℃</td><td>27℃</td></tr>
<tr><td>×</td><td>×</td><td>◑</td><td>◑</td><td>×</td><td>×</td><td>◑</td><td>◑</td><td>×</td><td>×</td><td>×</td><td>◑</td><td>◑</td><td>×</td></tr>
</table>
※ ● : ON ◑ : Flash ×: OFF
</td></tr>
<tr><td>Judgment Method</td><td>· Communication error between indoor and outdoor units.</td></tr>
<tr><td>Cause of problem</td><td>· Refer to the judgment method below.</td></tr>
</table>

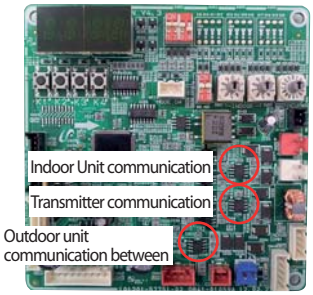
1. Cause of problem


Indoor Unit Installation Quantity Setup Switch of Outdoor Unit Compare and check the set value and the actual number of indoor units installed.
Are the number of actual installed indoor units and the set value for the installation quantity setup switch the same?
No
Correctly set the indoor unit installation quantity setup switch of the outdoor unit, and press the reset key (K3) of the outdoor PCB to re-execute tracking.
Yes
Press the reset key (K3) of the outdoor PCB, and check the display module to check for the quantity of indoor units that respond to the tracking.
Is there no sign of the indoor response on the display during tracking?
No
After 2 minutes, find the indoor unit which displays the communication error for the indoor units, and check for overlaps in the PCB address setup.
(If the indoor unit addresses are overlapped, then a communication error will occur).
- In this case, a communication error will occur in every indoor unit (two or more units) with the address incorrectly set.
Yes
Remove the communication cable which connects the outdoor unit to the indoor unit, and measure the 2 cables of the outdoor unit with a scope.
Is the voltage between the 2 cables a square wave with DC±0.7V or more?
No
Change the indoor unit PCB after checking the communication cable when there is no peculiarity with the address.
Yes
Check the communication cable which connects the outdoor unit to the indoor unit.
If there is no peculiarity, then connect the indoor units one by one to find the indoor unit that is interfering with the communication for inspection and change the indoor unit PCB.
Check the communication cable and the connector of the outdoor unit PCB, and change the PCB.

※ Essential Requirements before PCB Changes in Case of Communication Error Occurrence

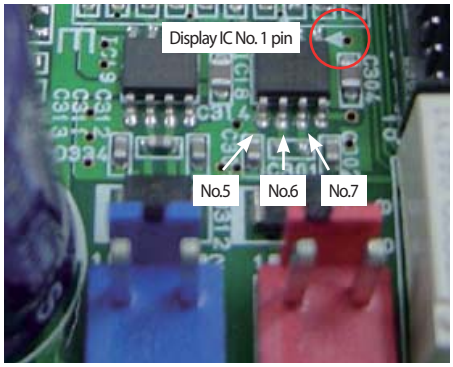
1. Find the communication IC near the communication terminal.
   - Indoor Unit
   - Above Red Connector : Communication IC between indoor and outdoor units.
   - Above Blue Connector : Communication IC for cable remote control.
   - Outdoor Unit
   - When there is module communication as in PLUS II and PLUS III –
     Above Red Connector of Main Unit : Communication IC between indoor and outdoor units.
   - When there is no module communication as in PLUS II and PLUS III –
     Above Yellow Connector of Each Unit : Communication IC between outdoor units.
   - Other Outdoor Unit- Above Communication Connector : Communication IC between indoor and outdoor unit.

Indoor Unit



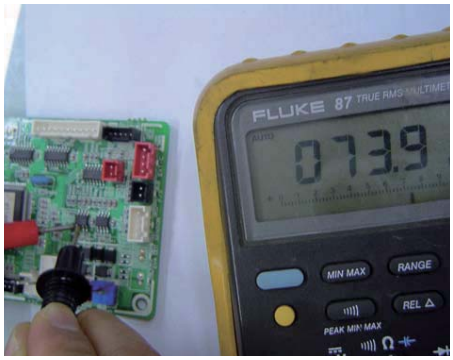
Outdoor Unit

2. Measure the resistance of the communication IC.
   - Measurement Method : Measure the No.5 - No.6 Pin resistance
     Measure the No.5 - No.7 Pin resistance
     Measure the No.5 - No.8 Pin resistance



3. Normal and defective judgment is tested for communication IC by using measured resistance.
   - Judging as Normal
   - Each resistance value should be measured in tens of kΩ~to hundreds of kΩ.
   - Difference between the two resistance values should be of some number of kΩ.

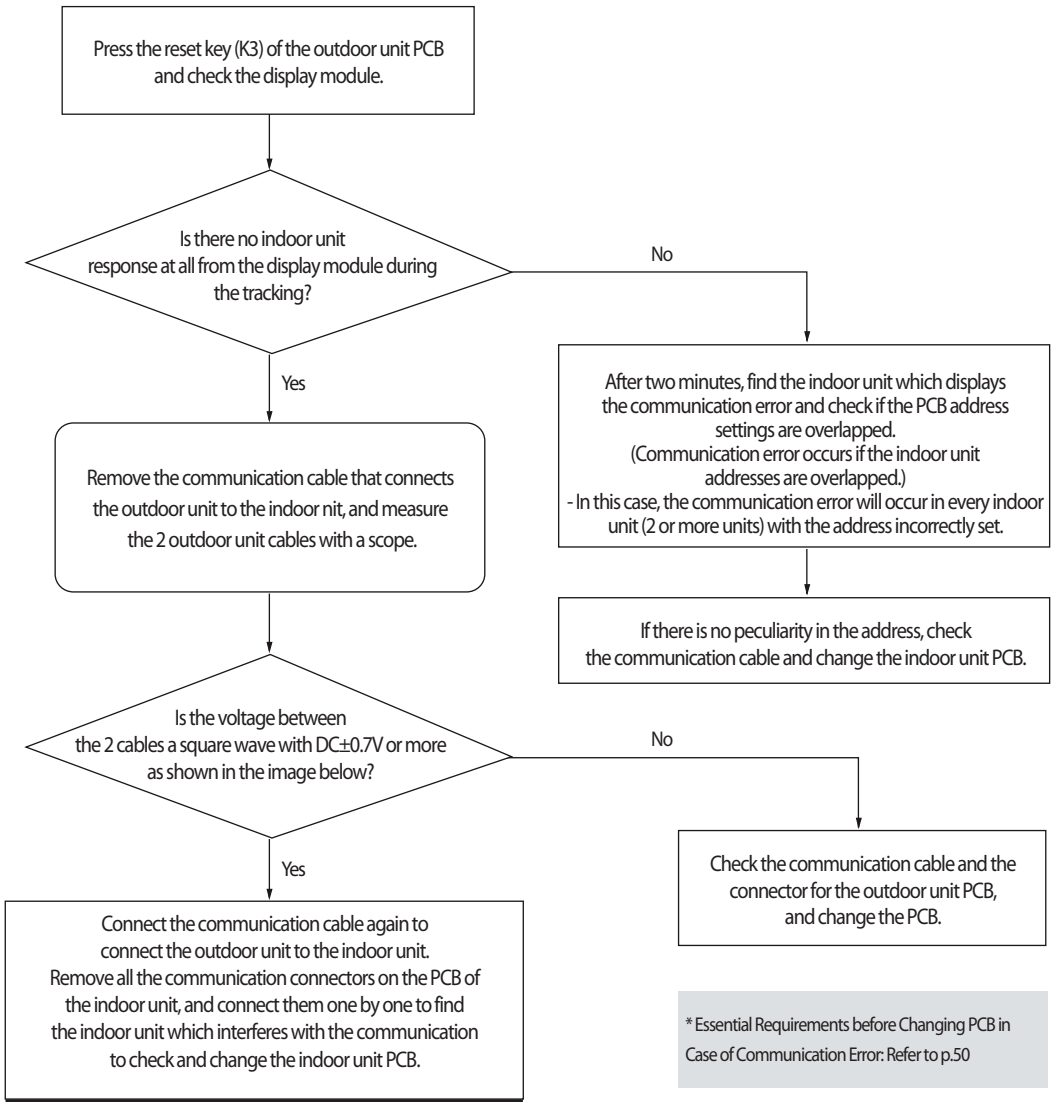
   - Judging as defective
   - One or both are low with tens of Ω
   - One or both of them is open

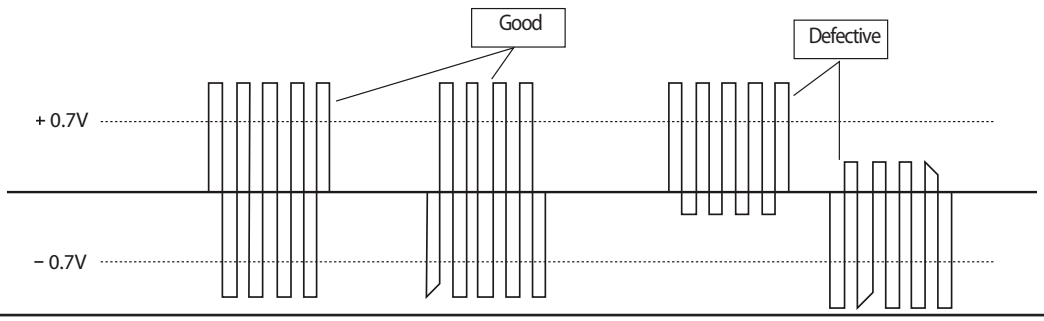


4-3-4 Communication Error between Indoor and Outdoor Units after Tracking

Outdoor unit display	E202
Indoorunit display	Duct, Cassette (1/2 Way),Console, Celing: Operation × / Defrost × / Timer ◑ / Fan ◑ / Filter/MPI × Cassette (4/Mini4 Way): Operation × / Defrost ◑ / Timer ◑ / Filter × Wall-mounted (NeoForte): Operation × / Timer × / Turbo ◑ / 24℃ ◑ / 27℃ × ※ ●: ON ◑: Flash ×: OFF
Judgment Method	· Outdoor unit is unable to communicate for two minutes during operation. (no reception of relocation)
Cause of problem	· Communication error between indoor and outdoor units and setup error of indoor unit installation quantity setup switch.

1. Cause of problem

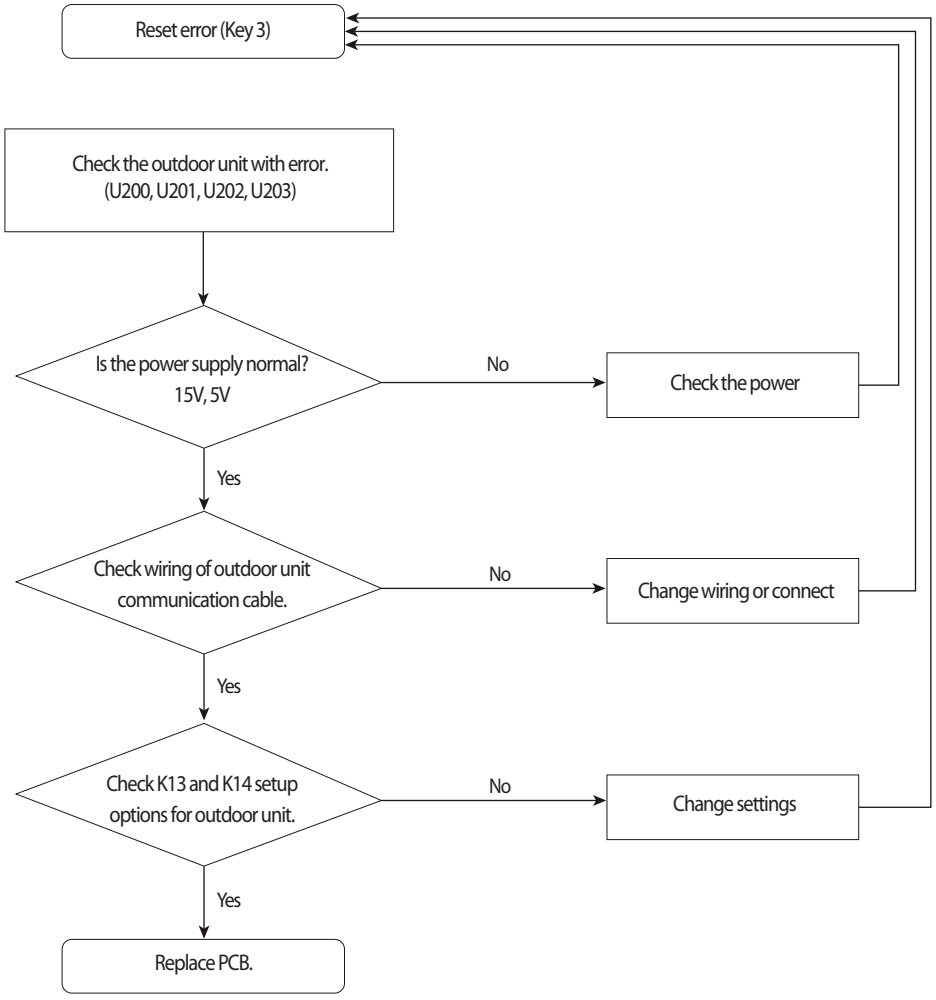

Press the reset key (K3) of the outdoor unit PCB and check the display module.
Is there no indoor unit response at all from the display module during the tracking?
No
Yes
After two minutes, find the indoor unit which displays the communication error and check if the PCB address settings are overlapped.
(Communication error occurs if the indoor unit addresses are overlapped.)
- In this case, the communication error will occur in every indoor unit (2 or more units) with the address incorrectly set.
Remove the communication cable that connects the outdoor unit to the indoor nit, and measure the 2 outdoor unit cables with a scope.
If there is no peculiarity in the address, check the communication cable and change the indoor unit PCB.
Is the voltage between the 2 cables a square wave with DC±0.7V or more as shown in the image below?
No
Yes
Check the communication cable and the connector for the outdoor unit PCB, and change the PCB.
Connect the communication cable again to connect the outdoor unit to the indoor unit.
Remove all the communication connectors on the PCB of the indoor unit, and connect them one by one to find the indoor unit which interferes with the communication to check and change the indoor unit PCB.
* Essential Requirements before Changing PCB in Case of Communication Error: Refer to p.50



4-3-5 Communication error between main and sub Unit of outdoor unit or between outdoor units

Outdoor unit display	E203
Indoorunit display	Duct, Cassette (1/2 Way),Console, Celing: Operation × / Defrost × / Timer ◑ / Fan ◑ / Filter/MPI × Cassette (4/Mini4 Way): Operation × / Defrost ◑ / Timer ◑ / Filter × Wall-mounted (NeoForte): Operation × / Timer × / Turbo ◑ / 24℃ ◑ / 27℃ × ※ ● : ON ◑ : Flash × : OFF
Judgment Method	· Refer to the judgment method below.
Cause of problem	· Communication error between outdoor units.

1. Cause of problem

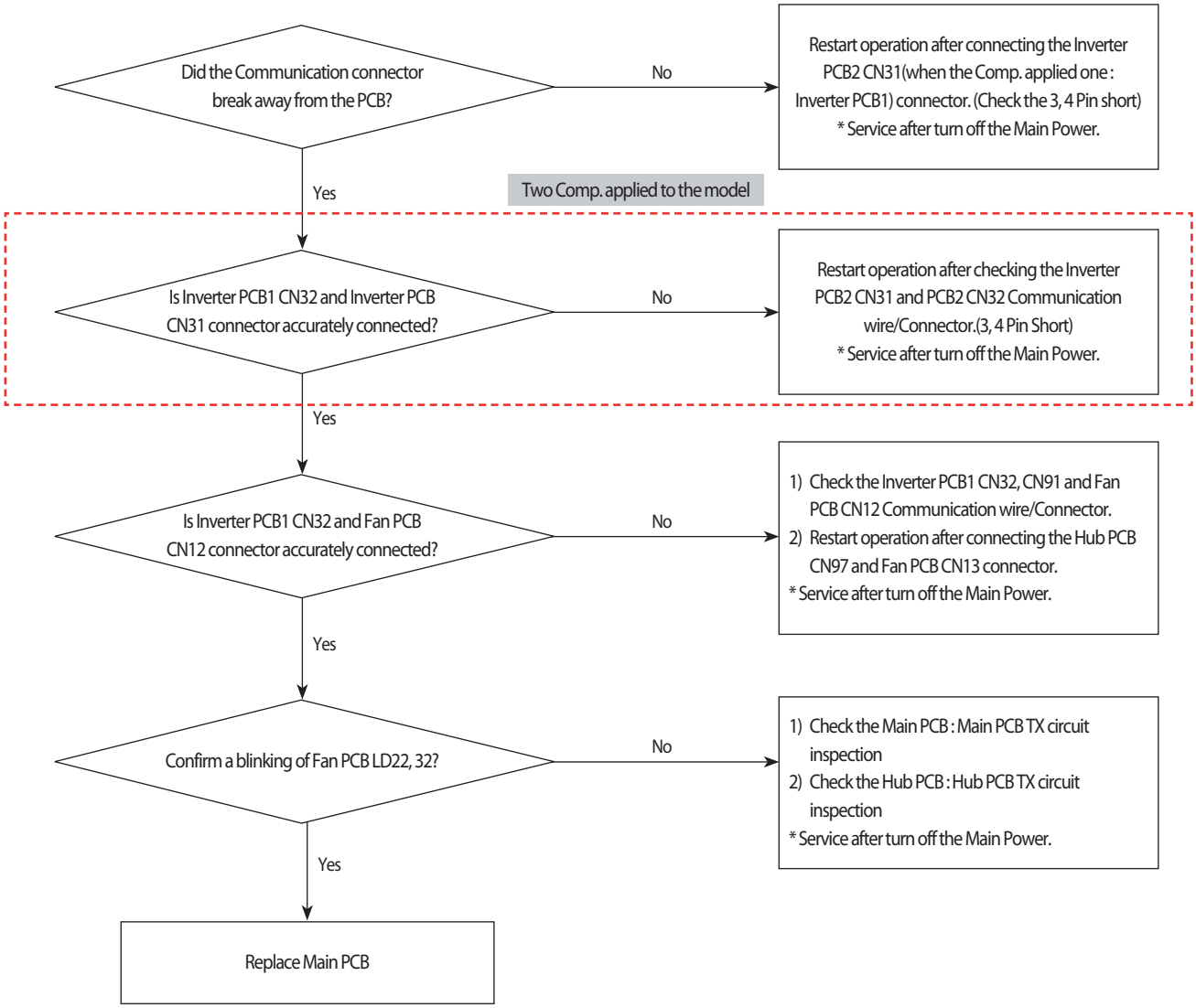


Essential Requirements before Changing PCB in Case of Communication Error: Refer to p.59

4-3-6 Internal Communication error of the Outdoor Unit C-Box

Outdoor unit display	E205
Indoorunit display	Duct, Cassette (1/2 Way),Console, Celing: Operation × / Defrost × / Timer ◑ / Fan ◑ / Filter/MPI × Cassette (4/Mini4 Way): Operation × / Defrost ◑ / Timer ◑ / Filter × Wall-mounted (NeoForte): Operation × / Timer × / Turbo ◑ / 24℃ ◑ / 27℃ × ※ ● : ON ◑ : Flash × : OFF
Judgment Method	· Communication error between the C-Box PCB
Cause of problem	· Communication wire inside the C-Box is unconnected · Main PCB defective

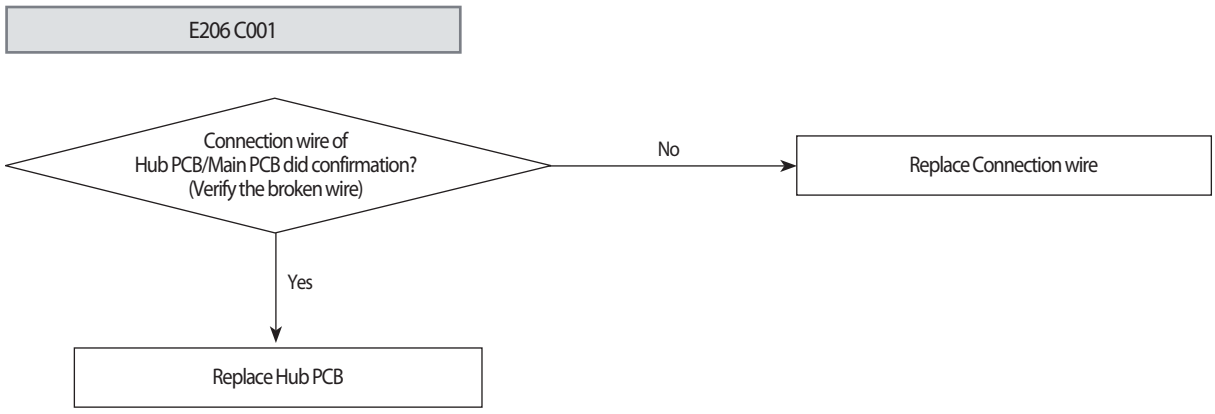
1. Cause of problem

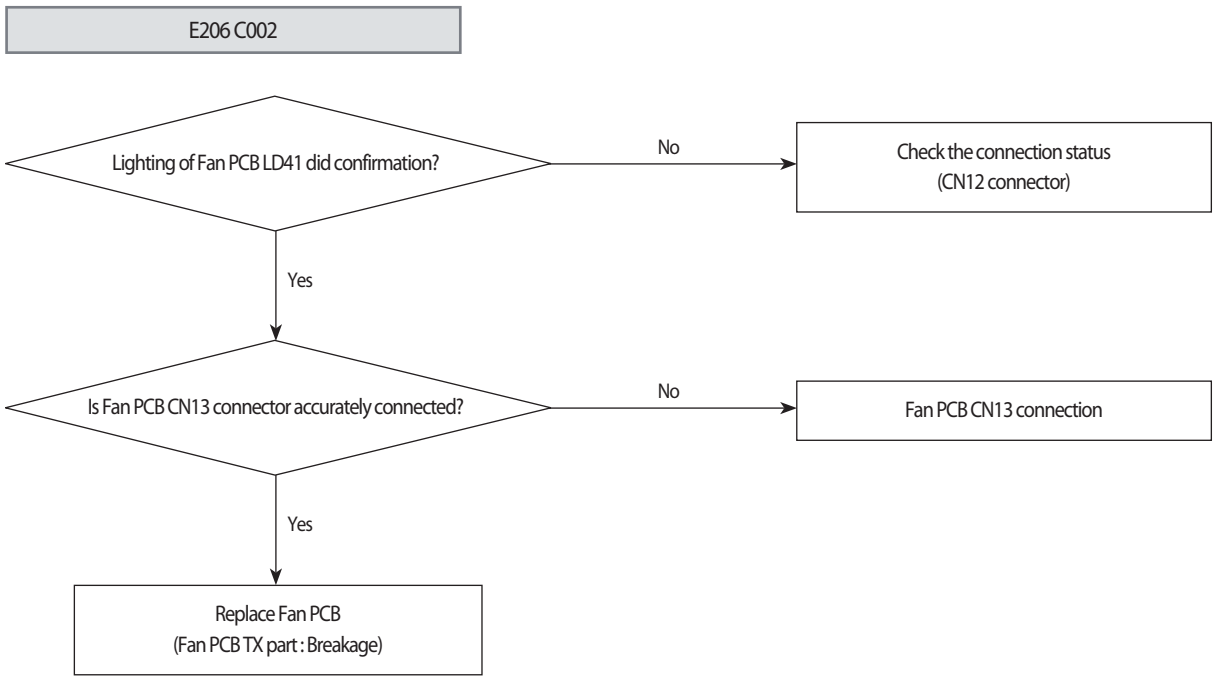

Did the Communication connector break away from the PCB?
No
Restart operation after connecting the Inverter PCB2 CN31(when the Comp. applied one : Inverter PCB1) connector. (Check the 3, 4 Pin short)
* Service after turn off the Main Power.
Yes
Two Comp. applied to the model
Is Inverter PCB1 CN32 and Inverter PCB CN31 connector accurately connected?
No
Restart operation after checking the Inverter PCB2 CN31 and PCB2 CN32 Communication wire/Connector.(3, 4 Pin Short)
* Service after turn off the Main Power.
Yes
Is Inverter PCB1 CN32 and Fan PCB CN12 connector accurately connected?
No
1) Check the Inverter PCB1 CN32, CN91 and Fan PCB CN12 Communication wire/Connector.
2) Restart operation after connecting the Hub PCB CN97 and Fan PCB CN13 connector.
* Service after turn off the Main Power.
Yes
Confirm a blinking of Fan PCB LD22, 32?
No
1) Check the Main PCB : Main PCB TX circuit inspection
2) Check the Hub PCB : Hub PCB TX circuit inspection
* Service after turn off the Main Power.
Yes
Replace Main PCB

4-3-7 Internal PCB Communication error of the Outdoor Unit C-Box

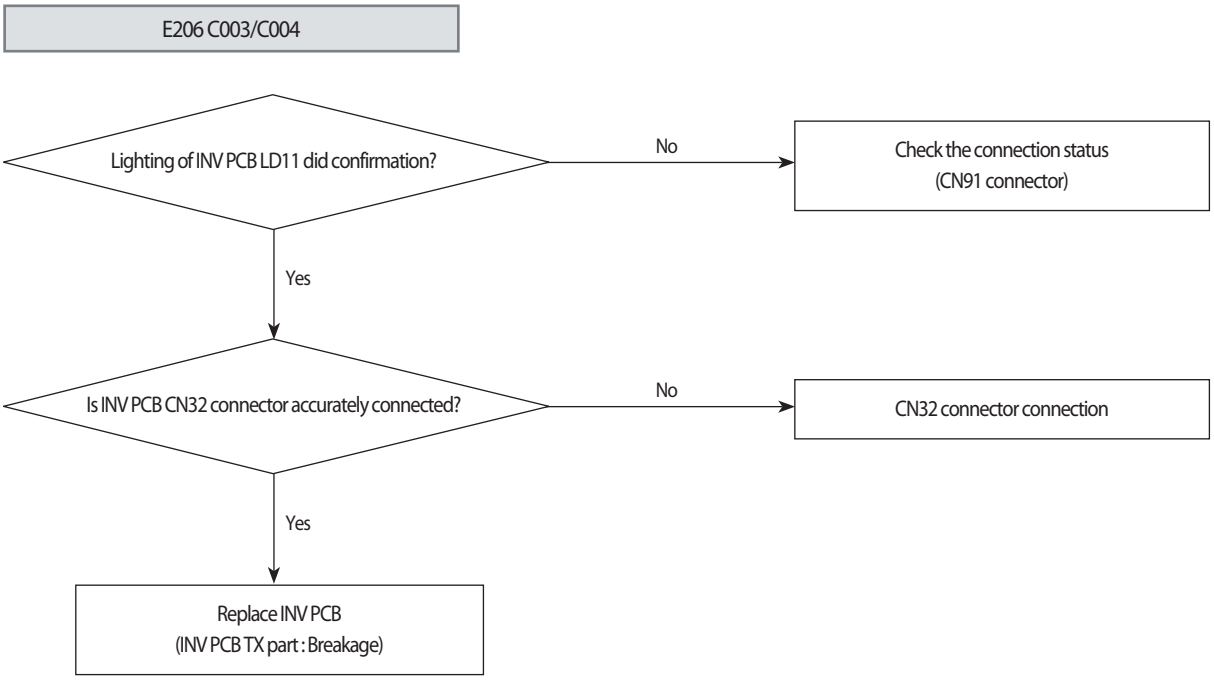
Outdoor unit display	E206
Indoorunit display	Duct, Cassette (1/2 Way),Console, Celing: Operation × / Defrost × / Timer ◑ / Fan ◑ / Filter/MPI × Cassette (4/Mini4 Way): Operation × / Defrost ◑ / Timer ◑ / Filter × Wall-mounted (NeoForte): Operation × / Timer × / Turbo ◑ / 24℃ ◑ / 27℃ × ※ ●: ON ◑: Flash ×: OFF
Judgment Method	· PCB does not respond to the invoked Main PCB
Cause of problem	· C-Box internal Inverter PCB, Fan PCB, Hub PCB defective

1. Cause of problem





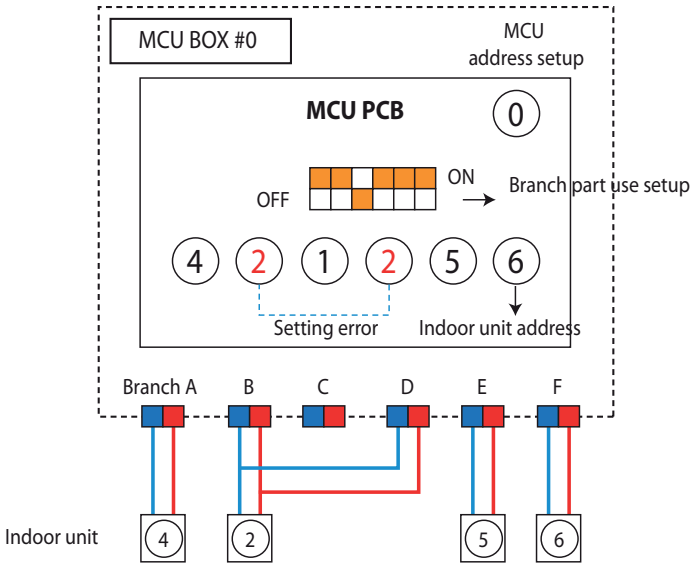
Internal PCB Communication error of the Outdoor Unit C-Box (cont.)



4-3-8 MCU branch part setup error – inconsecutive connection with the use of 2 branch parts

Outdoor unit display	E211
Indoor unit display	Duct, Cassette (1/2 Way),Console, Celing: Operation ×, Defrost ×, Timer ◑, Fan ◑, Filter/MPI × Cassette (4/Mini4 Way): Operation ×, Defrost ◑, Timer ◑, Filter × Wall-mounted (NeoForte): Operation ×, Timer ×, Turbo ◑, 24℃ ◑, 27℃ × ※ ● : ON ◑ : Flash × : OFF
Criteria	• When 2 branch parts are used for one indoor unit without connecting them consecutively.
Cause of problem	• Branch part assembly error

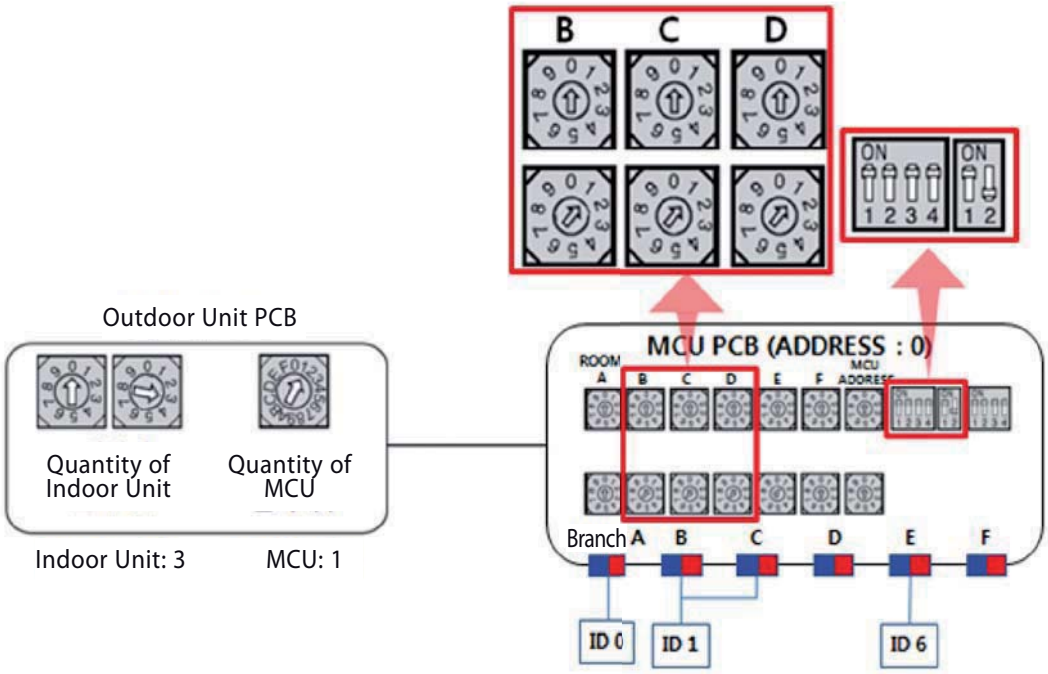
1. How to check
   Find an MCU that is composed as the following picture to carry out assembly of branch part again. After completing the re-setting, press K3 button on the button to reset or turn it off to restart.



4-3-9 MCU branch part setup error – Repeated setup for the same address over 3 times

Outdoor unit display	E2 12
Indoor unit display	Duct, Cassette (1/2 Way),Console, Celing: Operation × / Defrost × / Timer ◑ / Fan ◑ / Filter/MPI × Cassette (4/Mini4 Way): Operation × / Defrost ◑ / Timer ◑ / Filter × Wall-mounted (NeoForte): Operation × / Timer × / Turbo ◑ / 24℃ ◑ / 27℃ × ※ ●: ON ◑: Flash ×: OFF
Criteria	• The same indoor unit address was setup more than 3 times in MCU
Cause of problem	• MCU indoor unit address setting error

1. How to check
   Find an MCU that is composed as the following picture to carry out assembly of branch part again. After completing the re-setting, press K3 button on the button to reset or turn it off to restart.

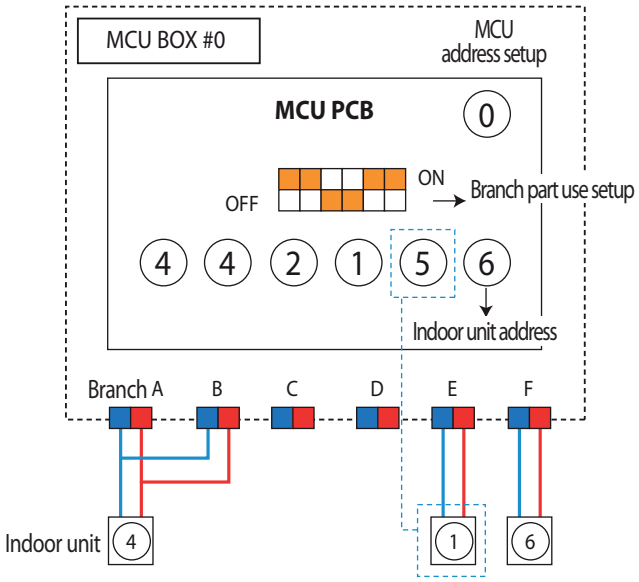


4-3-10 MCU branch part setup error – non-installed address setup

Outdoor unit display	E213
Indoor unit display	Duct, Cassette (1/2 Way),Console, Celing: Operation × / Defrost × / Timer ◑ / Fan ◑ / Filter/MPI × Cassette (4/Mini4 Way): Operation × / Defrost ◑ / Timer ◑ / Filter × Wall-mounted (NeoForte): Operation × / Timer × / Turbo ◑ / 24℃ ◑ / 27℃ × ※ ●: ON ◑: Flash ×: OFF
Criteria	• If there is an indoor unit that is not installed among MCU registered indoor units
Cause of problem	• Indoor unit, with the assigned address on MCU, not installed.

1. How to check

   Find an MCU that is composed as the following picture to carry out assembly of branch part again. After completing the re-setting, press K3 button on the button to reset or turn it off to restart.

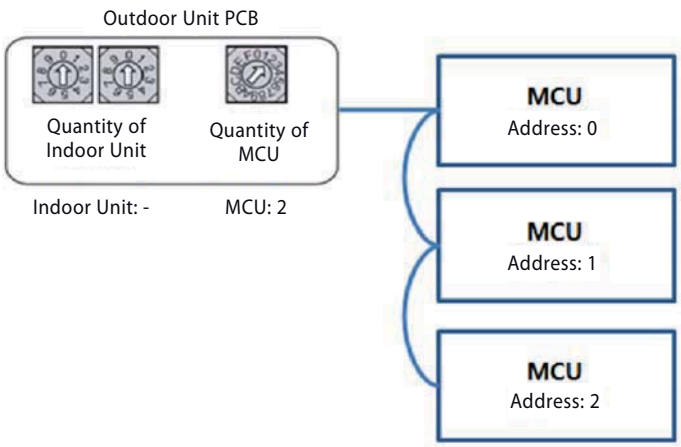


4-3-11 Setup Error for MCU Branch part – Setup Error for MCU Quantity Used

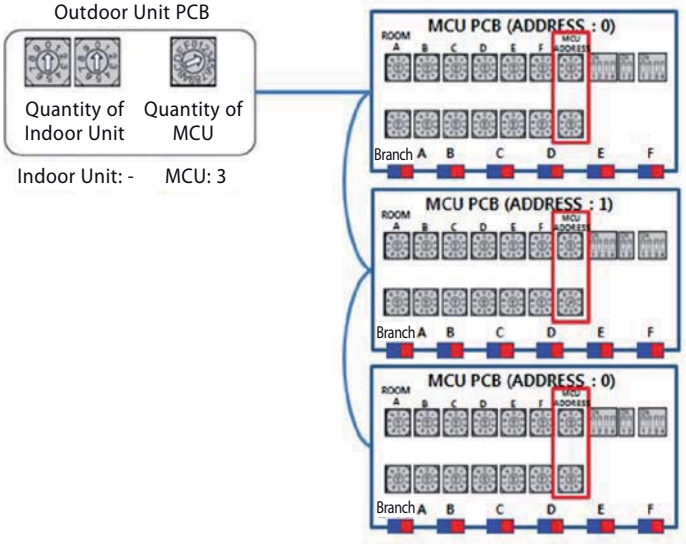
Outdoor Unit Display	E2 14
Indoor Unit Display	Duct, Cassette (1/2 Way),Console, Celing: Operation × / Defrost × / Timer ◑ / Fan ◑ / Filter/MPI × Cassette (4/Mini4 Way): Operation × / Defrost ◑ / Timer ◑ / Filter × Wall-mounted (NeoForte): Operation × / Timer × / Turbo ◑ / 24℃ ◑ / 27℃ × ※ ● : ON ◑ : Flash × : OFF
Judgment Method	• Occurs when the quantity of MCU is incorrectly set by the outdoor unit. • Occurs when same addresses are found when two or more MCU are connected.
Special Cause	• Outdoor unit MCU setup and same address errors when connecting two or more MCUs .

1. Inspection Method : Check the Main PCB MCU quantity setting switch of the outdoor unit and check the installed MCU quantity matches.
   Check whether each MCU PCB address switch was duplicated.
   To use, reset by pressing the K3 button of the outdoor unit after the reset is completed, or reset after turning off the power and then turn it on again.

• Example of MCU quantity setting error
ex) PCB MCU setting quantity of outdoor unit = 2 / MCU installed Quantity = 3



• Example of MCU address setting error
ex) Two among three of MCU address was set to 0


Outdoor Unit PCB
Quantity of Indoor Unit
Quantity of MCU
Indoor Unit: -
MCU: 3
MCU PCB (ADDRESS : 0)
MCU PCB (ADDRESS : 1)
MCU PCB (ADDRESS : 0)
Branch A B C D E F

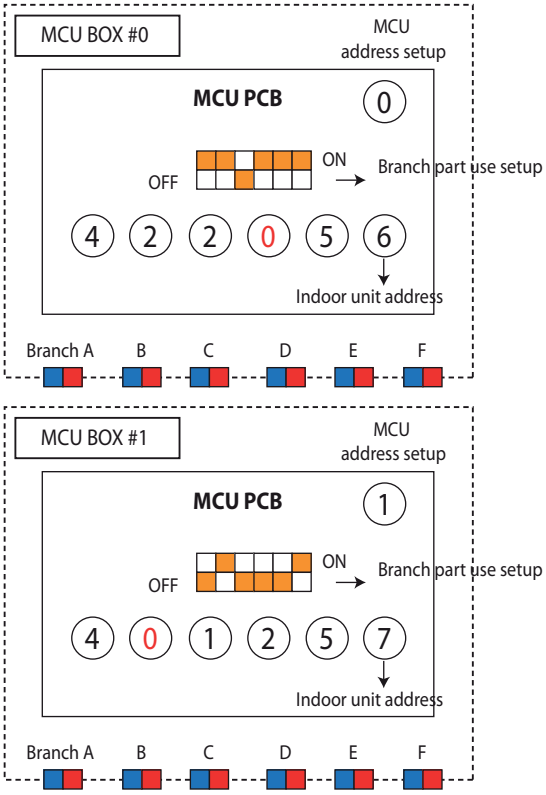
4-3-12 MCU branch part setup error – Overlapping Indoor unit Address setup

Outdoor unit display	E215
Indoor unit display	Duct, Cassette (1/2 Way),Console, Celing: Operation × / Defrost × / Timer ◑ / Fan ◑ / Filter/MPI × Cassette (4/Mini4 Way): Operation × / Defrost ◑ / Timer ◑ / Filter × Wall-mounted (NeoForte): Operation × / Timer × / Turbo ◑ / 24℃ ◑ / 27℃ × ※ ● : ON ◑ : Flash ×: OFF
Criteria	• Occurs when an indoor unit address setup switch in MCU has been overlapped
Cause of problem	• Repeated indoor unit address

1. How to check

   Check the setup switch for the number of indoor units in MCU

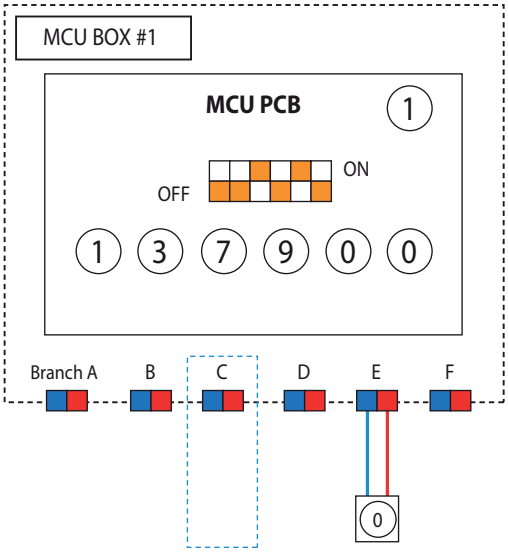
   After completing resetting, press the outdoor unit's K3 button to reset or turn off to restart.



4-3-13 MCU branch part setup error – Set as being used without connection to an Indoor unit

Outdoor unit display	E216
Indoor unit display	Duct, Cassette (1/2 Way),Console, Celing: Operation × / Defrost × / Timer ◑ / Fan ◑ / Filter/MPI × Cassette (4/Mini4 Way): Operation × / Defrost ◑ / Timer ◑ / Filter × Wall-mounted (NeoForte): Operation × / Timer × / Turbo ◑ / 24℃ ◑ / 27℃ × ※ ● : ON ◑ : Flash × : OFF
Criteria	• Occurs when MCU PIPE is set as being used, yet not connected to an indoor unit
Cause of problem	• Pipe is not installed to the indoor unit with assigned address on MCU

1. How to check
   Adjust the Dip switch that sets up the use of MCU branch part to 'Not-Used'. After completing resetting, press the outdoor unit's K3 button to reset or turn off to restart.

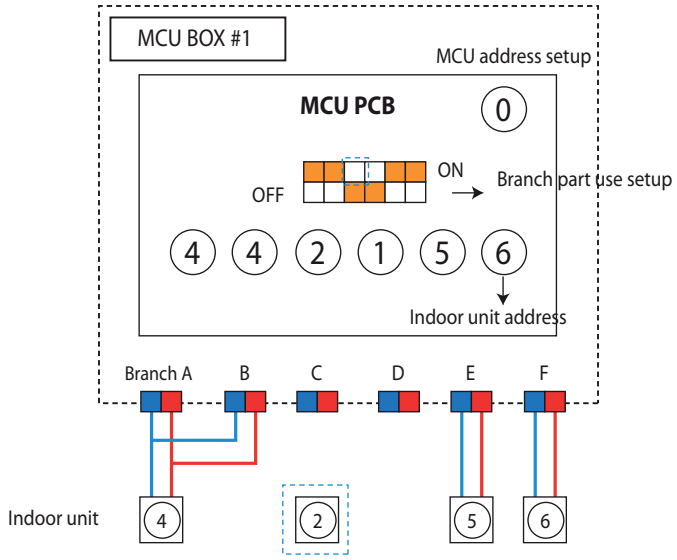


4-3-14 MCU branch part setup error – Connect an Indoor unit to a branch part not being used

Outdoor unit display	E217
Indoor unit display	Duct, Cassette (1/2 Way),Console, Celing: Operation × / Defrost × / Timer ◑ / Fan ◑ / Filter/MPI × Cassette (4/Mini4 Way): Operation × / Defrost ◑ / Timer ◑ / Filter × Wall-mounted (NeoForte): Operation × / Timer × / Turbo ◑ / 24℃ ◑ / 27℃ × ※ ● : ON ◑ : Flash ×: OFF
Criteria	• Occurs when MCU PIPE is turned off, yet an indoor unit is registered
Cause of problem	• Indoor unit connection to the unused branch part

1. How to check

   Check the actual use of the branch part. If it is used, turn on the Dip switch for branch part setup. After completing resetting, press the outdoor unit's K3 button to reset or turn off to restart.

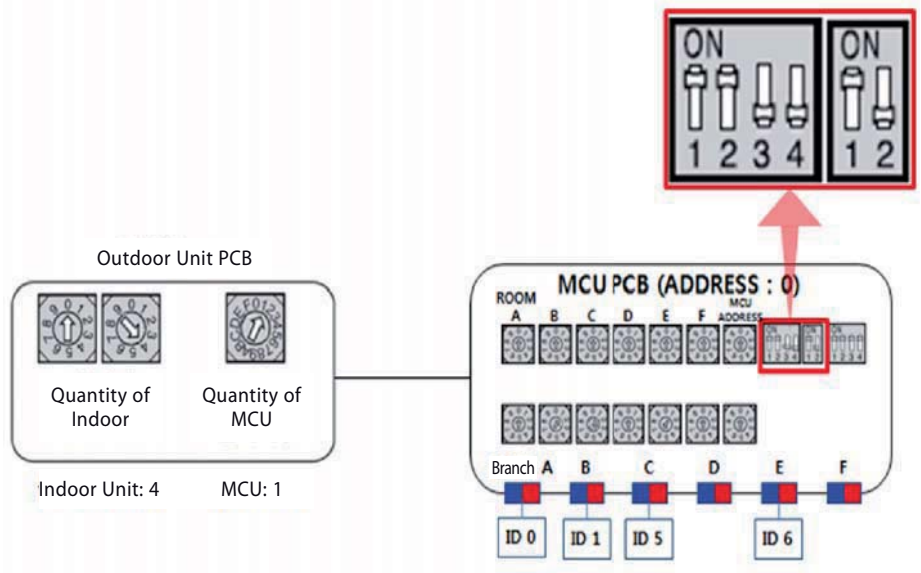


4-3-15 MCU branch part setup error – Connect more Indoor units than what is actually set up in MCU

Outdoor unit display	E218
Indoor unit display	Duct, Cassette (1/2 Way),Console, Celing: Operation × / Defrost × / Timer ◑ / Fan ◑ / Filter/MPI × Cassette (4/Mini4 Way): Operation × / Defrost ◑ / Timer ◑ / Filter × Wall-mounted (NeoForte): Operation × / Timer × / Turbo ◑ / 24℃ ◑ / 27℃ × ※ ●: ON ◑: Flash ×: OFF
Criteria	• Occurs when the number of indoor unit installed exceeds that setting in MCU
Cause of problem	• Number of indoor units exceeds number of indoor units entered on MCU setting

1. How to check
   Check the number of indoor units connected to MCU then readjust the switch for the number of units
   After completing resetting, press the outdoor unit's K3 button to reset or turn off to restart.

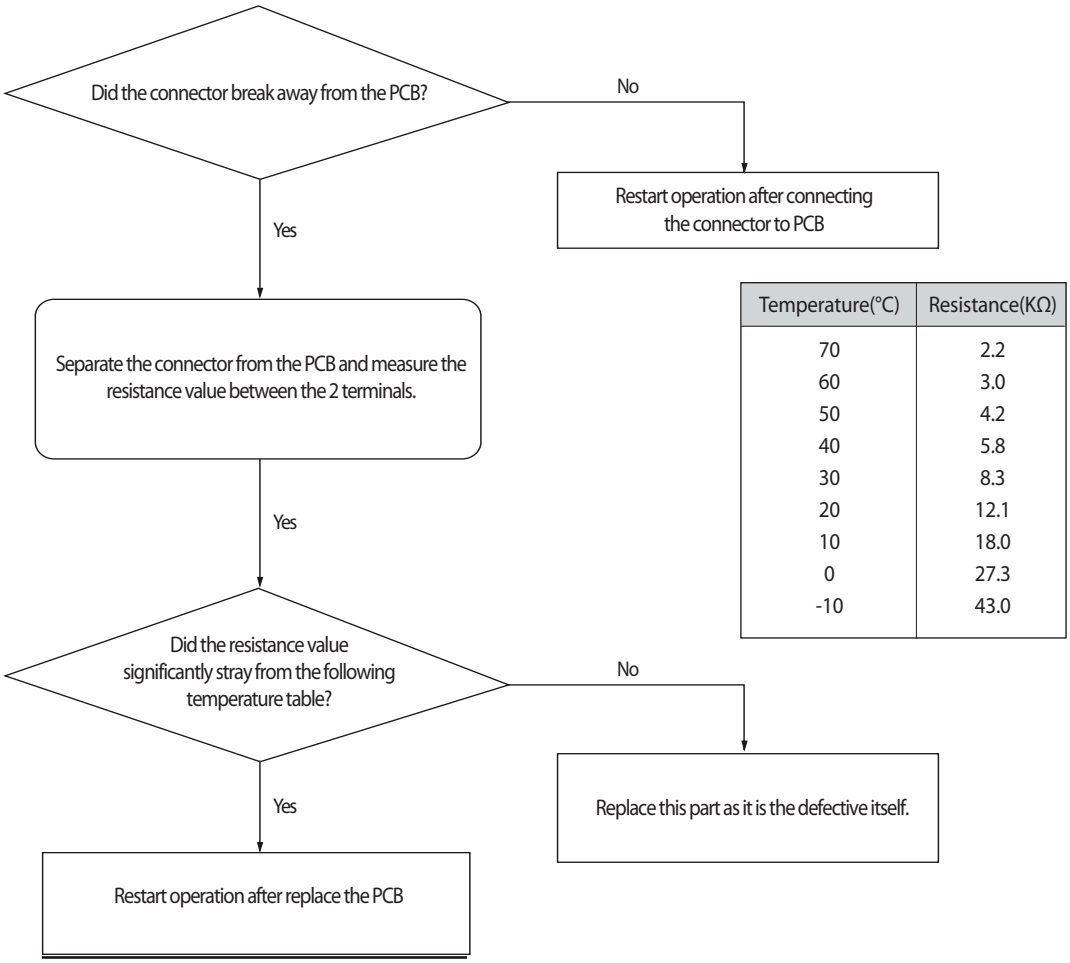
• Example of MCU indoor unit setting DIP switch error
ex) Indoor unit No.5 was connected to branch part C, but DIP switch No.3 (branch part C) is off.



4-3-16 MCU subcooler entrance/exit sensor error (Open/Short)

Outdoor unit display	E219 (FAN PCB(FAN1)) E220 (FAN PCB(FAN2))
Indoor Unit Display	Duct, Cassette (1/2 Way),Console, Celing: Operation ◑ / Defrost × / Timer × / Fan ◑ / Filter/MPI × Cassette (4/Mini4 Way): Operation ◑ / Defrost × / Timer ◑ / Filter × Wall-mounted (NeoForte): Operation ◑ / Timer × / Turbo × / 24℃ ◑ / 27℃ × ※ ● : ON ◑ : Flash × : OFF
Judgment Method	· Fan rotation defective or vibration and noise of the defective operation. · Hall IC there is no signal input.
Cause of problem	· Connection status error. · Hall IC wire disconnection. · Defective circuit parts and defective manufacturing. · Fan Motor defective.

1. Cause of problem

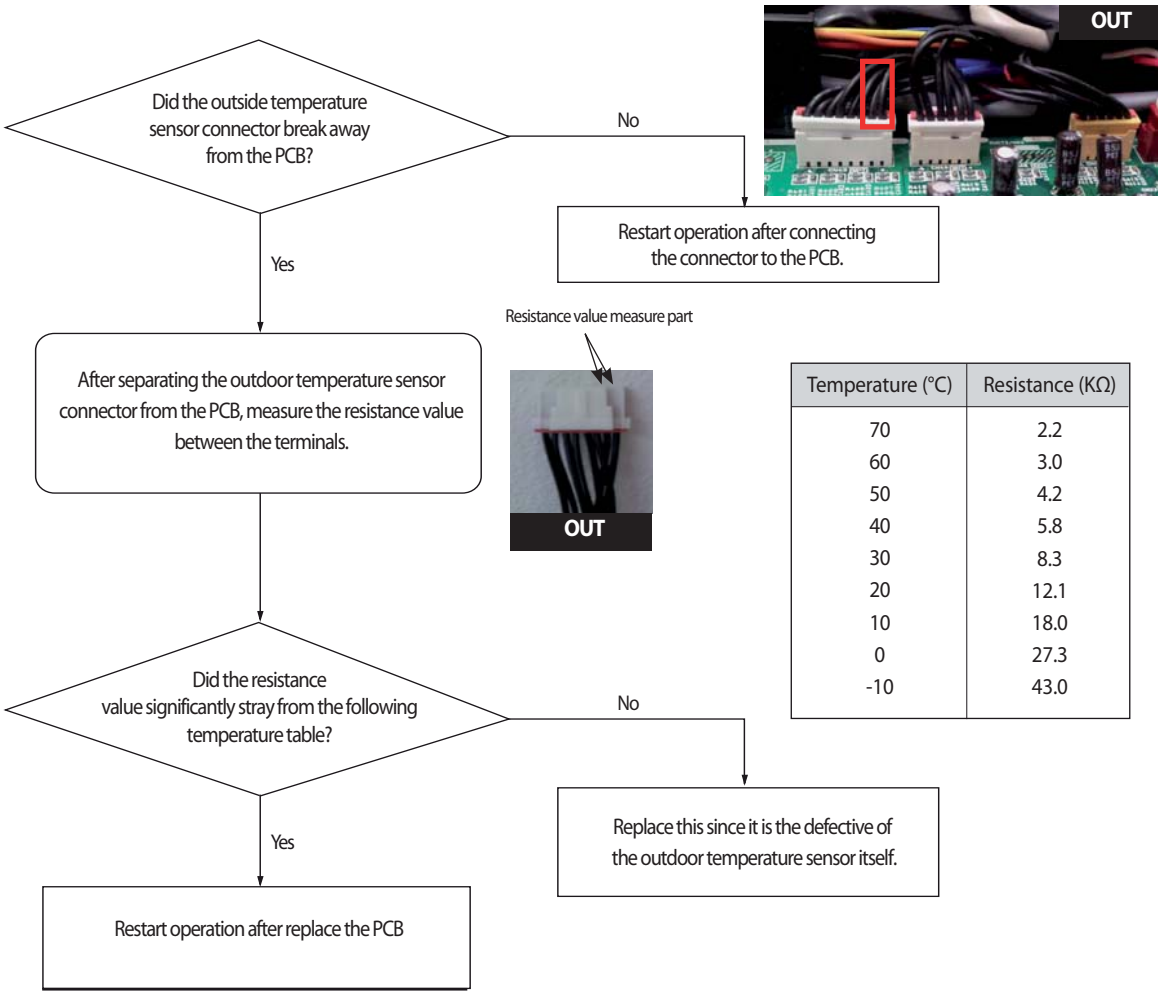

Did the connector break away from the PCB?
No
Restart operation after connecting the connector to PCB
Yes
Separate the connector from the PCB and measure the resistance value between the 2 terminals.
Yes
Did the resistance value significantly stray from the following temperature table?
No
Replace this part as it is the defective itself.
Yes
Restart operation after replace the PCB

Temperature(°C)	Resistance(KΩ)
70	2.2
60	3.0
50	4.2
40	5.8
30	8.3
20	12.1
10	18.0
0	27.3
-10	43.0

4-3-17 Outdoor Temperature Sensor Error

Outdoor unit display	E221
Indoorunit display	Duct, Cassette (1/2 Way),Console, Celing: Operation ◑, Defrost ×, Timer ×, Fan ◑, Filter/MPI × Cassette (4/Mini4 Way): Operation ◑, Defrost ×, Timer ◑, Filter × Wall-mounted (NeoForte): Operation ◑, Timer ×, Turbo ×, 24℃ ◑, 27℃ × ※ ●: ON ◑: Flash ×: OFF
Judgment Method	· Refer to the judgment method below.
Cause of problem	· Outdoor temperature sensor Open/Short is defective.

1. Cause of problem


Did the outside temperature sensor connector break away from the PCB?
No
Restart operation after connecting the connector to the PCB.
OUT
Yes
After separating the outdoor temperature sensor connector from the PCB, measure the resistance value between the terminals.
Resistance value measure part
OUT
Did the resistance value significantly stray from the following temperature table?
No
Replace this since it is the defective of the outdoor temperature sensor itself.
Yes
Restart operation after replace the PCB

Temperature (°C)	Resistance (KΩ)
70	2.2
60	3.0
50	4.2
40	5.8
30	8.3
20	12.1
10	18.0
0	27.3
-10	43.0

4-3-18 Cond Out Temperature Sensor Error (Open/Short)

Outdoor unit display	E231
Indoorunit display	Duct, Cassette (1/2 Way),Console, Celing: Operation ◑ / Defrost × / Timer × / Fan ◑ / Filter/MPI × Cassette (4/Mini4 Way): Operation ◑ / Defrost × / Timer ◑ / Filter × Wall-mounted (NeoForte): Operation ◑ / Timer × / Turbo × / 24℃ ◑ / 27℃ × ※ ● : ON ◑ : Flash × : OFF
Judgment Method	· Refer to the judgment method below.
Cause of problem	· Disconnection or breakdown of relevant sensor.

1. Cause of problem

Did the outdoor Cond Out sensor connector break away from the PCB?

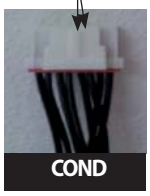
No

Restart operation after connecting the connector to the PCB.

Yes

After separating the outdoor Cond Out sensor connector from the PCB, measure the resistance value between the two terminals.

Resistance value measure part



Temperature (°C)	Resistance (KΩ)
70	2.2
60	3.0
50	4.2
40	5.8
30	8.3
20	12.1
10	18.0
0	27.3
-10	43.0

Did the resistance value significantly stray from the following temperature table?

No

Replace this part as it is the defective of the outdoor Cond Out sensor itself.

Yes

Restart operation after replace the PCB

4-3-19 Outdoor Cond Out sensor breakaway error

<table>
<tr><td>Outdoor unit display</td><td>E241</td></tr>
<tr><td>Indoorunit display</td><td>
<table>
<tr><td colspan="5">Duct, Cassette (1/2 Way),Console, Celing</td><td colspan="4">Cassette (4/Mini4 Way)</td><td colspan="5">Wall-mounted (NeoForte)</td></tr>
<tr><td>Operation</td><td>Defrost</td><td>Timer</td><td>Fan</td><td>Filter/MPI</td><td>Operation</td><td>Defrost</td><td>Timer</td><td>Filter</td><td>Operation</td><td>Timer</td><td>Turbo</td><td>24℃</td><td>27℃</td></tr>
<tr><td>×</td><td>×</td><td>◑</td><td>◑</td><td>◑</td><td>×</td><td>◑</td><td>◑</td><td>◑</td><td>×</td><td>×</td><td>◑</td><td>◑</td><td>◑</td></tr>
</table>
※ ● : ON ◑ : Flash ×: OFF
</td></tr>
<tr><td>Judgment Method</td><td>· Refer to the judgment method below.</td></tr>
<tr><td>Cause of problem</td><td>· Outdoor Cond Out sensor breakaway/defective/ relevant path blocked.</td></tr>
</table>

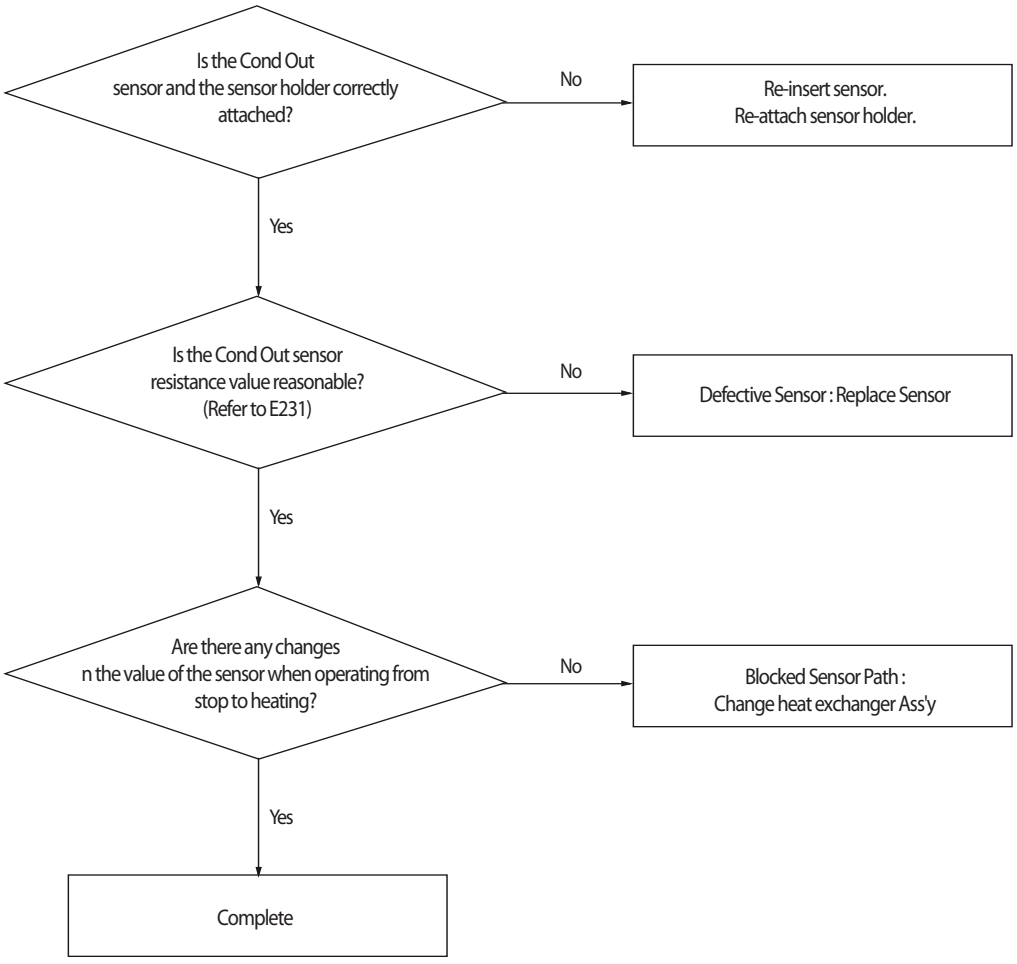
1. Judgment Method

   1) No inspection for Cooling operation.

   2) For heating operation (Each of the conditions below needs to be satisfied for more than 20 minutes.)

High pressure average > 25kg/cm^2	OK
Low pressure average < 8.5kg/cm^2	OK
Teva, out - Tair, in ≥ 3℃	OK
Teva, in - Tair, in ≥ 2℃	OK
Tcond, out - Tair, out ≤ 0℃	NO
Every compressor is in operation & indoor unit operation and Thermo On	OK
Error Content	Outdoor Cond Out sensor breakaway error

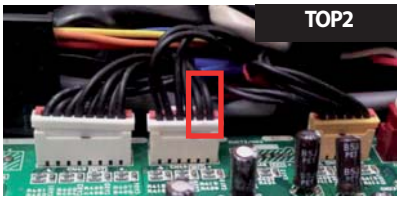
2. Cause of problem

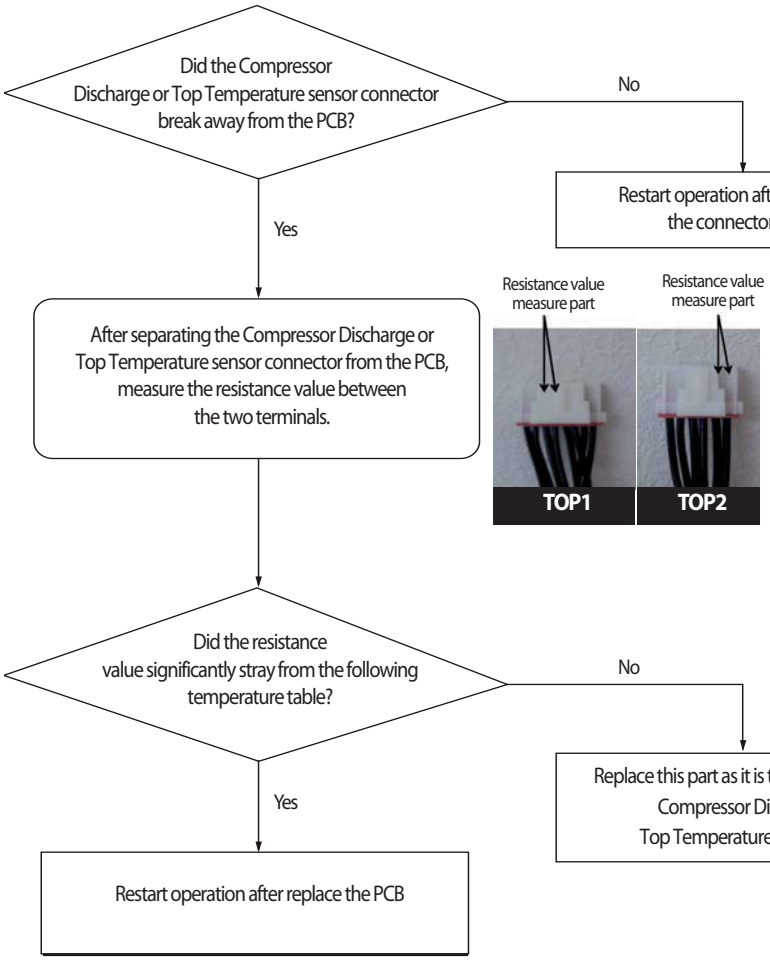

Is the Cond Out sensor and the sensor holder correctly attached?
No
Re-insert sensor. Re-attach sensor holder.
Yes
Is the Cond Out sensor resistance value reasonable? (Refer to E231)
No
Defective Sensor : Replace Sensor
Yes
Are there any changes n the value of the sensor when operating from stop to heating?
No
Blocked Sensor Path : Change heat exchanger Ass'y
Yes
Complete

4-3-20 Compressor Discharge or Top 1/2 Temperature sensor error

Outdoor unit display	E251 (Compressor 1 Discharge) E257 (Compressor 2 Discharge) E276 (Compressor 1 Top) E277 (Compressor 2 Top)
Indoorunit display	Duct, Cassette (1/2 Way),Console, Celing: Operation ×, Defrost ×, Timer ◑, Fan ◑, Filter/MPI ◑ Cassette (4/Mini4 Way): Operation ×, Defrost ◑, Timer ◑, Filter ◑ Wall-mounted (NeoForte): Operation ×, Timer ×, Turbo ◑, 24℃ ◑, 27℃ ◑ ※ ●: ON ◑: Flash ×: OFF
Judgment Method	· Refer to the judgment method below.
Cause of problem	· Compressor Discharge or Top Temperature sensor defective. (Open/Short)

1. Cause of problem



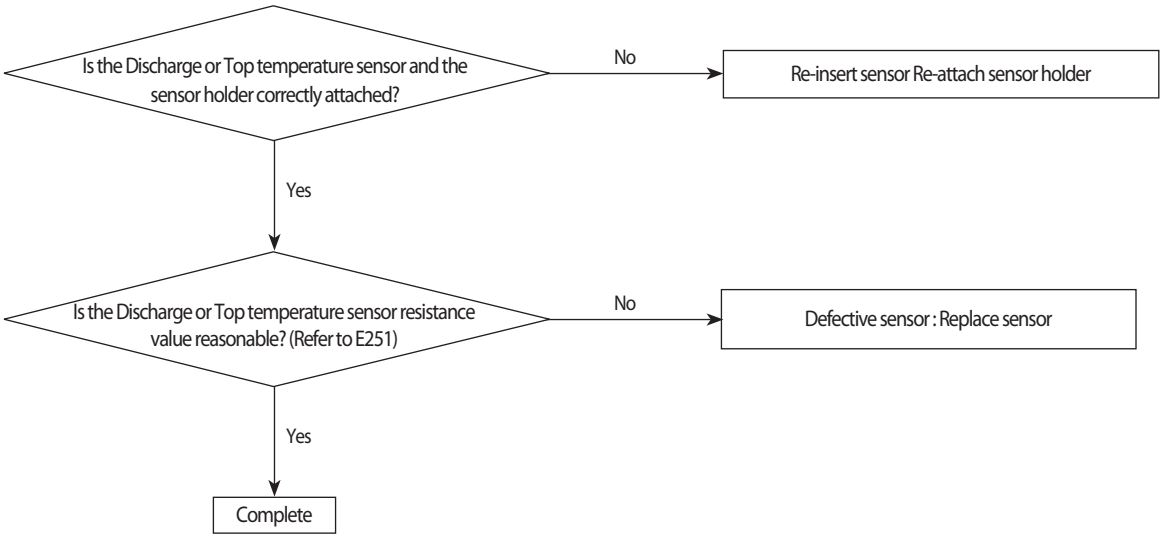

Did the Compressor Discharge or Top Temperature sensor connector break away from the PCB?
No
Restart operation after connecting the connector to PCB
Yes
After separating the Compressor Discharge or Top Temperature sensor connector from the PCB, measure the resistance value between the two terminals.
Resistance value measure part
Resistance value measure part
TOP1
TOP2
Did the resistance value significantly stray from the following temperature table?
No
Replace this part as it is the defective of the Compressor Discharge or Top Temperature sensor itself.
Yes
Restart operation after replace the PCB

Temperature (°C)	Resistance (KΩ)
130	8.9
120	11.2
100	18.5
80	32.0
60	59.0
25	200.0
20	242.0
10	362.0
0	553.0

4-3-21 Compressor Discharge or Top temperature sensor breakaway error

<table>
<tr><td>Outdoor unit display</td><td>E262 (Compressor 1 Discharge) E263 (Compressor 2 Discharge)
E266 (Compressor 1 Top) E267 (Compressor 2 Top)</td></tr>
<tr><td>Indoorunit display</td><td>
<table>
<tr><th colspan="5">Duct, Cassette (1/2 Way),Console, Celing</th><th colspan="4">Cassette (4/Mini4 Way)</th><th colspan="5">Wall-mounted (NeoForte)</th></tr>
<tr><th>Operation</th><th>Defrost</th><th>Timer</th><th>Fan</th><th>Filter/MPI</th><th>Operation</th><th>Defrost</th><th>Timer</th><th>Filter</th><th>Operation</th><th>Timer</th><th>Turbo</th><th>24℃</th><th>27℃</th></tr>
<tr><td>×</td><td>×</td><td>◑</td><td>◑</td><td>◑</td><td>×</td><td>◑</td><td>◑</td><td>◑</td><td>×</td><td>×</td><td>◑</td><td>◑</td><td>◑</td></tr>
</table>
※ ●: ON ◑: Flash ×: OFF
</td></tr>
<tr><td>Judgment Method</td><td>1) Relevant compressor frequency of 60Hz or higher.
2) Suction temperature > Low pressure saturation temperature +10 ℃
3) Relevant discharge or Top temperature < High pressure saturation temperature
4) In case of keep 30 minutes in state that satisfy all above conditions (1, 2, 3).</td></tr>
<tr><td>Cause of problem</td><td>· Compressor discharge or Top temperature sensor breakaway and defective / Starting badness of compressor</td></tr>
</table>

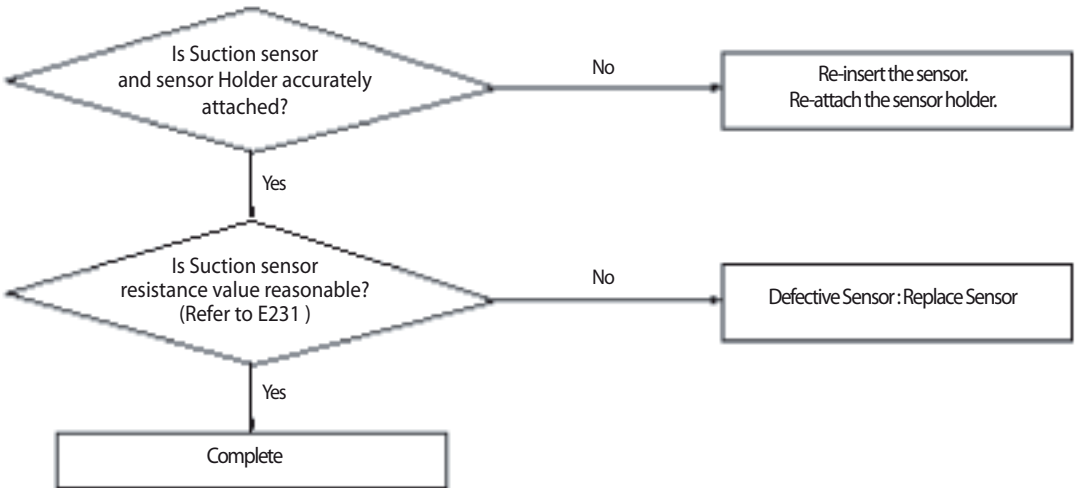
1. Cause of problem


Is the Discharge or Top temperature sensor and the sensor holder correctly attached?
No
Re-insert sensor Re-attach sensor holder
Yes
Is the Discharge or Top temperature sensor resistance value reasonable? (Refer to E251)
No
Defective sensor : Replace sensor
Yes
Complete

4-3-22 E269 : Suction Temperature sensor breakaway error

<table>
<tr><td>Outdoor unit display</td><td>E269</td></tr>
<tr><td>Indoorunit display</td><td>
<table>
<tr><th colspan="5">Duct, Cassette (1/2 Way),Console, Celing</th><th colspan="4">Cassette (4/Mini4 Way)</th><th colspan="5">Wall-mounted (NeoForte)</th></tr>
<tr><th>Operation</th><th>Defrost</th><th>Timer</th><th>Fan</th><th>Filter/MPI</th><th>Operation</th><th>Defrost</th><th>Timer</th><th>Filter</th><th>Operation</th><th>Timer</th><th>Turbo</th><th>24℃</th><th>27℃</th></tr>
<tr><td>×</td><td>×</td><td>◑</td><td>◑</td><td>◑</td><td>×</td><td>◑</td><td>◑</td><td>◑</td><td>×</td><td>×</td><td>◑</td><td>◑</td><td>◑</td></tr>
</table>
※ ● : ON ◑ : Flash ×: OFF
</td></tr>
<tr><td>Judgment Method</td><td>· Judgment Method : Difference of suction temperature of compressor starting verge and suction temperature that is on present operation : If less than 2 ℃ for 30 minutes to keep.(Judgment at heating operation only)</td></tr>
<tr><td>Cause of problem</td><td>· Suction temperature sensor breakaway/defective.</td></tr>
</table>

1. Cause of problem

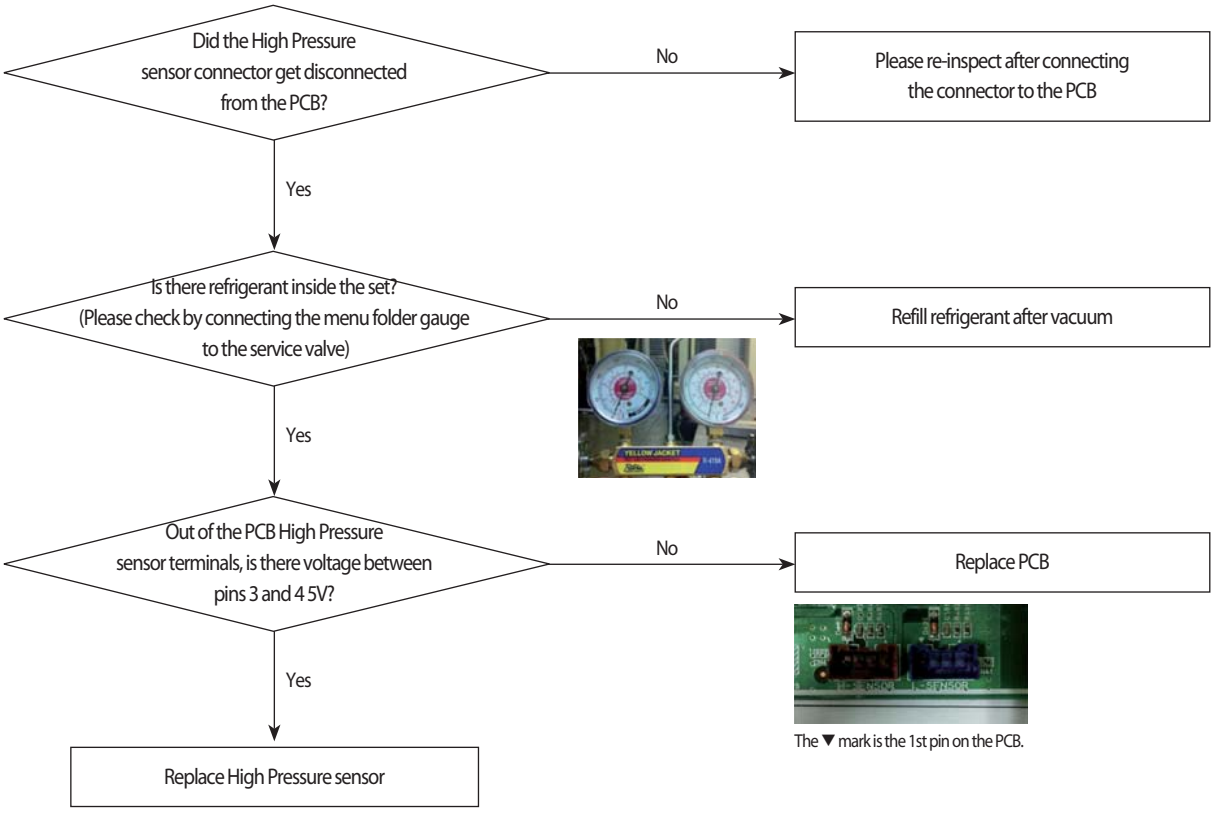


4-3-23 High Pressure sensor error (Open/Short)

<table>
<tr><td>Outdoor unit display</td><td>E291</td></tr>
<tr><td>Indoorunit display</td><td>
<table>
<tr><td colspan="5">Duct, Cassette (1/2 Way),Console, Celing</td><td colspan="4">Cassette (4/Mini4 Way)</td><td colspan="5">Wall-mounted (NeoForte)</td></tr>
<tr><td>Operation</td><td>Defrost</td><td>Timer</td><td>Fan</td><td>Filter/MPI</td><td>Operation</td><td>Defrost</td><td>Timer</td><td>Filter</td><td>Operation</td><td>Timer</td><td>Turbo</td><td>24℃</td><td>27℃</td></tr>
<tr><td>◑</td><td>×</td><td>×</td><td>◑</td><td>×</td><td>◑</td><td>×</td><td>◑</td><td>×</td><td>◑</td><td>×</td><td>×</td><td>◑</td><td>×</td></tr>
</table>
※ ● : ON ◑ : Flash ×: OFF
</td></tr>
<tr><td>Judgment Method</td><td>· Refer to the judgment method below.</td></tr>
<tr><td>Cause of problem</td><td>· Disconnection or breakdown of relevant sensor.</td></tr>
</table>

1. High Pressure sensor Open/Short error determination method
   1) Identifies from when power is supplied or 2 minutes after RESET, and only when set is stopped.
   2) An Open/Short error will occur if the input voltage standard range of 0.5V ~ 4.95V is exceeded.

2. Inspection Method


Did the High Pressure sensor connector get disconnected from the PCB?
No
Please re-inspect after connecting the connector to the PCB
Yes
Is there refrigerant inside the set? (Please check by connecting the menu folder gauge to the service valve)
No
Refill refrigerant after vacuum
Yes
Out of the PCB High Pressure sensor terminals, is there voltage between pins 3 and 4 5V?
No
Replace PCB
Yes
Replace High Pressure sensor

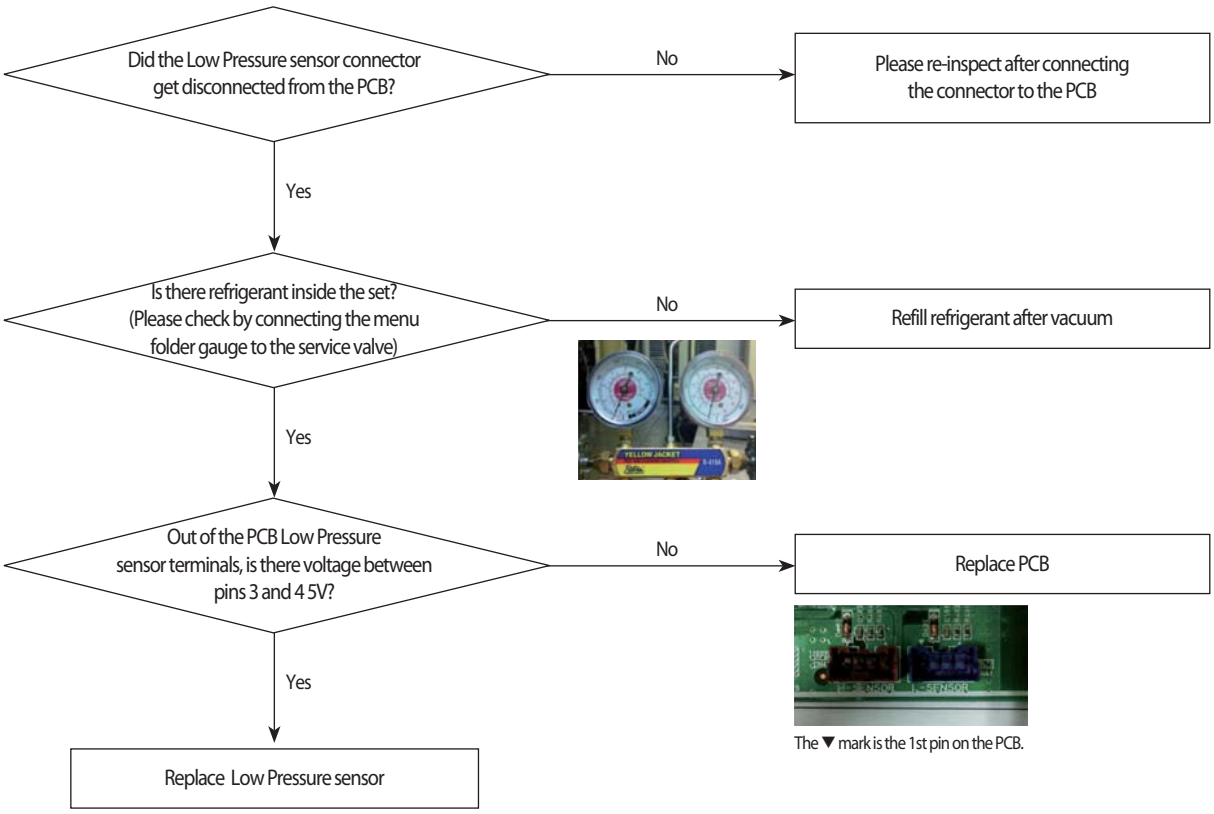
The ▼ mark is the 1st pin on the PCB.

4-3-24 Low Pressure sensor error (Open/Short)

Outdoor unit display	E296
Indoorunit display	Duct, Cassette (1/2 Way),Console, Celing: Operation ◑, Defrost ×, Timer ×, Fan ◑, Filter/MPI × Cassette (4/Mini4 Way): Operation ◑, Defrost ×, Timer ◑, Filter × Wall-mounted (NeoForte): Operation ◑, Timer ×, Turbo ×, 24℃ ◑, 27℃ × ※ ● : ON ◑ : Flash × : OFF
Judgment Method	· Refer to the judgment method below.
Cause of problem	· Disconnection or breakdown of relevant sensor.

1. Low Pressure sensor Open/Short error determination method
   1) Identifies from when power is supplied or 2 minutes after RESET, and only when set is stopped.
   2) An Open/Short error will occur if the input voltage standard range of 0.5V ~ 4.95V is exceeded.

2. Inspection Method

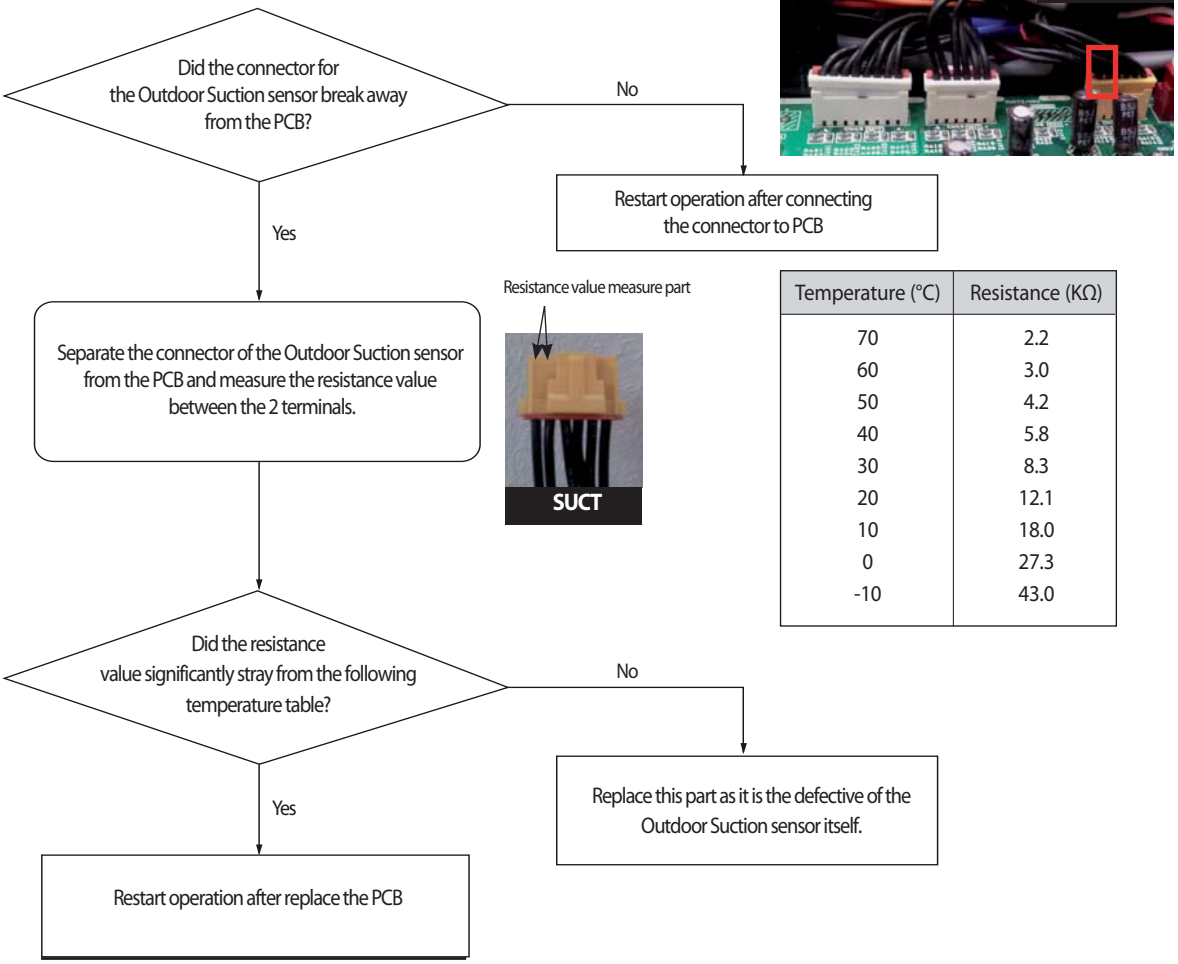

Did the Low Pressure sensor connector get disconnected from the PCB?
No
Please re-inspect after connecting the connector to the PCB
Yes
Is there refrigerant inside the set? (Please check by connecting the menu folder gauge to the service valve)
No
Refill refrigerant after vacuum
Yes
Out of the PCB Low Pressure sensor terminals, is there voltage between pins 3 and 4 5V?
No
Replace PCB
Yes
Replace Low Pressure sensor

The ▼ mark is the 1st pin on the PCB.

4-3-25 Suction Temperature sensor error (Open/Short)

Outdoor unit display	E308
Indoorunit display	Duct, Cassette (1/2 Way),Console, Celing: Operation ◑ / Defrost × / Timer × / Fan ◑ / Filter/MPI × Cassette (4/Mini4 Way): Operation ◑ / Defrost × / Timer ◑ / Filter × Wall-mounted (NeoForte): Operation ◑ / Timer × / Turbo × / 24℃ ◑ / 27℃ × ※ ● : ON ◑ : Flash ×: OFF
Judgment Method	· Refer to the judgment method below.
Cause of problem	· Disconnection or breakdown of relevant sensor.

1. Cause of problem

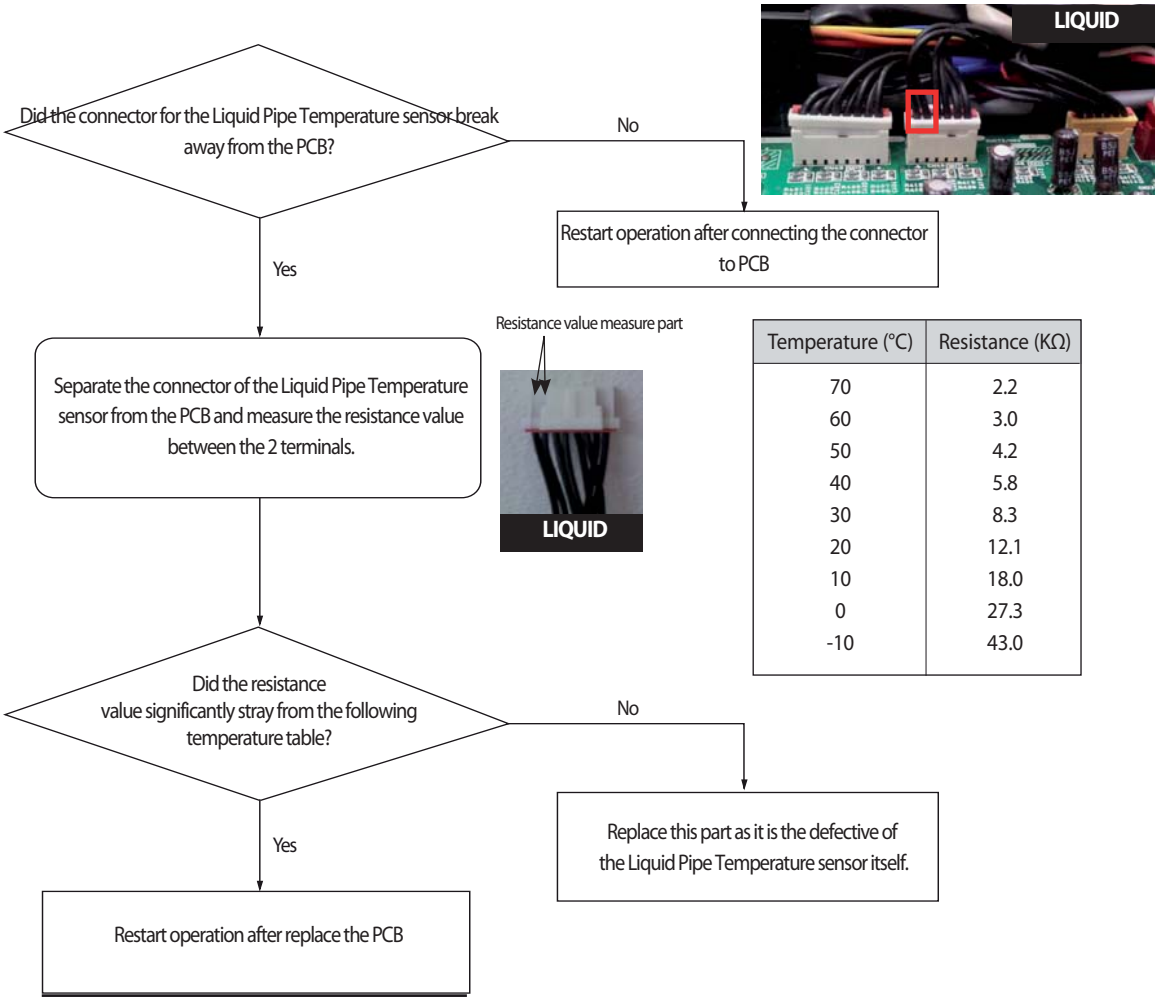

Did the connector for the Outdoor Suction sensor break away from the PCB?
No
Restart operation after connecting the connector to PCB
Yes
Separate the connector of the Outdoor Suction sensor from the PCB and measure the resistance value between the 2 terminals.
Resistance value measure part
SUCT
SUCT
Did the resistance value significantly stray from the following temperature table?
No
Replace this part as it is the defective of the Outdoor Suction sensor itself.
Yes
Restart operation after replace the PCB

Temperature (°C)	Resistance (KΩ)
70	2.2
60	3.0
50	4.2
40	5.8
30	8.3
20	12.1
10	18.0
0	27.3
-10	43.0

4-3-26 Liquid Pipe Temperature sensor error (Open/Short)

Outdoor unit display	E311
Indoorunit display	Duct, Cassette (1/2 Way),Console, Celing: Operation ◑ / Defrost × / Timer × / Fan ◑ / Filter/MPI × Cassette (4/Mini4 Way): Operation ◑ / Defrost × / Timer ◑ / Filter × Wall-mounted (NeoForte): Operation ◑ / Timer × / Turbo × / 24℃ ◑ / 27℃ × ※ ●: ON ◑: Flash ×: OFF
Judgment Method	· Refer to the judgment method below.
Cause of problem	· Disconnection or breakdown of relevant sensor.

1. Cause of problem

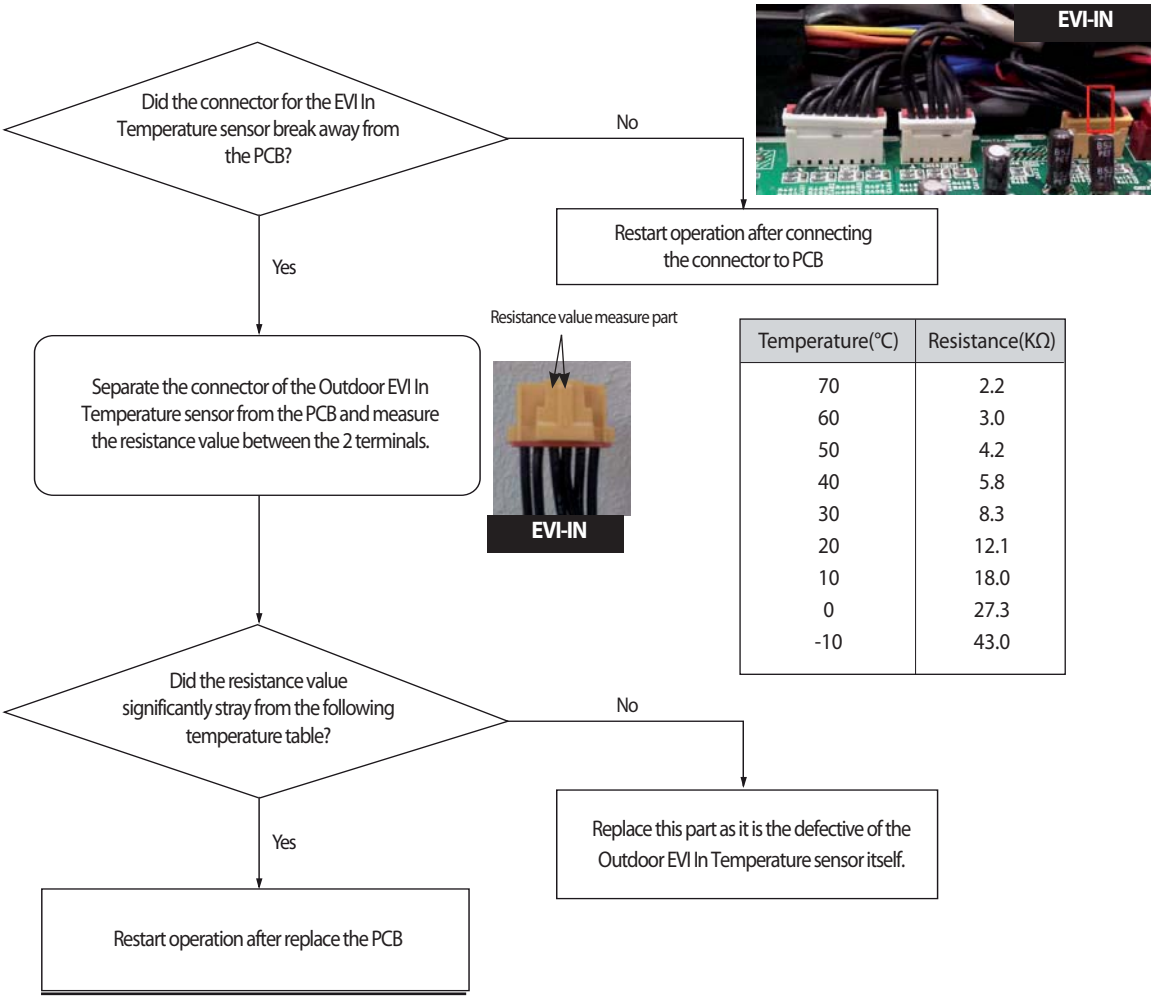

Did the connector for the Liquid Pipe Temperature sensor break away from the PCB?
No
Yes
Restart operation after connecting the connector to PCB
LIQUID
Resistance value measure part
LIQUID
Separate the connector of the Liquid Pipe Temperature sensor from the PCB and measure the resistance value between the 2 terminals.
Did the resistance value significantly stray from the following temperature table?
No
Yes
Replace this part as it is the defective of the Liquid Pipe Temperature sensor itself.
Restart operation after replace the PCB

Temperature (°C)	Resistance (KΩ)
70	2.2
60	3.0
50	4.2
40	5.8
30	8.3
20	12.1
10	18.0
0	27.3
-10	43.0

4-3-27 EVI In Temperature sensor error (Open/Short)

Outdoor unit display	E321
Indoorunit display	Duct, Cassette (1/2 Way),Console, Celing: Operation ◑ / Defrost × / Timer × / Fan ◑ / Filter/MPI × Cassette (4/Mini4 Way): Operation ◑ / Defrost × / Timer ◑ / Filter × Wall-mounted (NeoForte): Operation ◑ / Timer × / Turbo × / 24℃ ◑ / 27℃ × ※ ● : ON ◑ : Flash × : OFF
Judgment Method	· Refer to the judgment method below.
Cause of problem	· Disconnection or breakdown of relevant sensor.

1. Cause of problem


Did the connector for the EVI In Temperature sensor break away from the PCB?
No
Restart operation after connecting the connector to PCB
Yes
Separate the connector of the Outdoor EVI In Temperature sensor from the PCB and measure the resistance value between the 2 terminals.
Resistance value measure part
EVI-IN
EVI-IN
Temperature(°C) | Resistance(KΩ)
70 | 2.2
60 | 3.0
50 | 4.2
40 | 5.8
30 | 8.3
20 | 12.1
10 | 18.0
0 | 27.3
-10 | 43.0
Did the resistance value significantly stray from the following temperature table?
No
Replace this part as it is the defective of the Outdoor EVI In Temperature sensor itself.
Yes
Restart operation after replace the PCB

4-3-28 EVI Out Temperature sensor error (Open/Short)

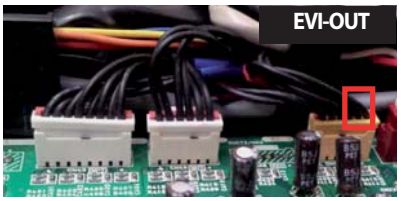
Outdoor unit display	E322
Indoorunit display	Duct, Cassette (1/2 Way),Console, Celing / Cassette (4/Mini4 Way) / Wall-mounted (NeoForte)

Duct, Cassette (1/2 Way),Console, Celing					Cassette (4/Mini4 Way)				Wall-mounted (NeoForte)				
Operation	Defrost	Timer	Fan	Filter/MPI	Operation	Defrost	Timer	Filter	Operation	Timer	Turbo	24℃	27℃
◑	×	×	◑	×	◑	×	◑	×	◑	×	×	◑	×

※ ● : ON ◑ : Flash × : OFF

Judgment Method	· Refer to the judgment method below.
Cause of problem	· Disconnection or breakdown of relevant sensor.

1. Cause of problem



Did the connector for the EVI Out Temperature sensor break away from the PCB?

No

Restart operation after connecting the connector to PCB

Yes

Separate the connector of the Outdoor EVI Out Temperature sensor from the PCB and measure the resistance value between the 2 terminals.

Resistance value measure part

Temperature(°C)	Resistance(KΩ)
70	2.2
60	3.0
50	4.2
40	5.8
30	8.3
20	12.1
10	18.0
0	27.3
-10	43.0

Did the resistance value significantly stray from the following temperature table?

No

Replace this part as it is the defective of the Outdoor EVI Out Temperature sensor itself.

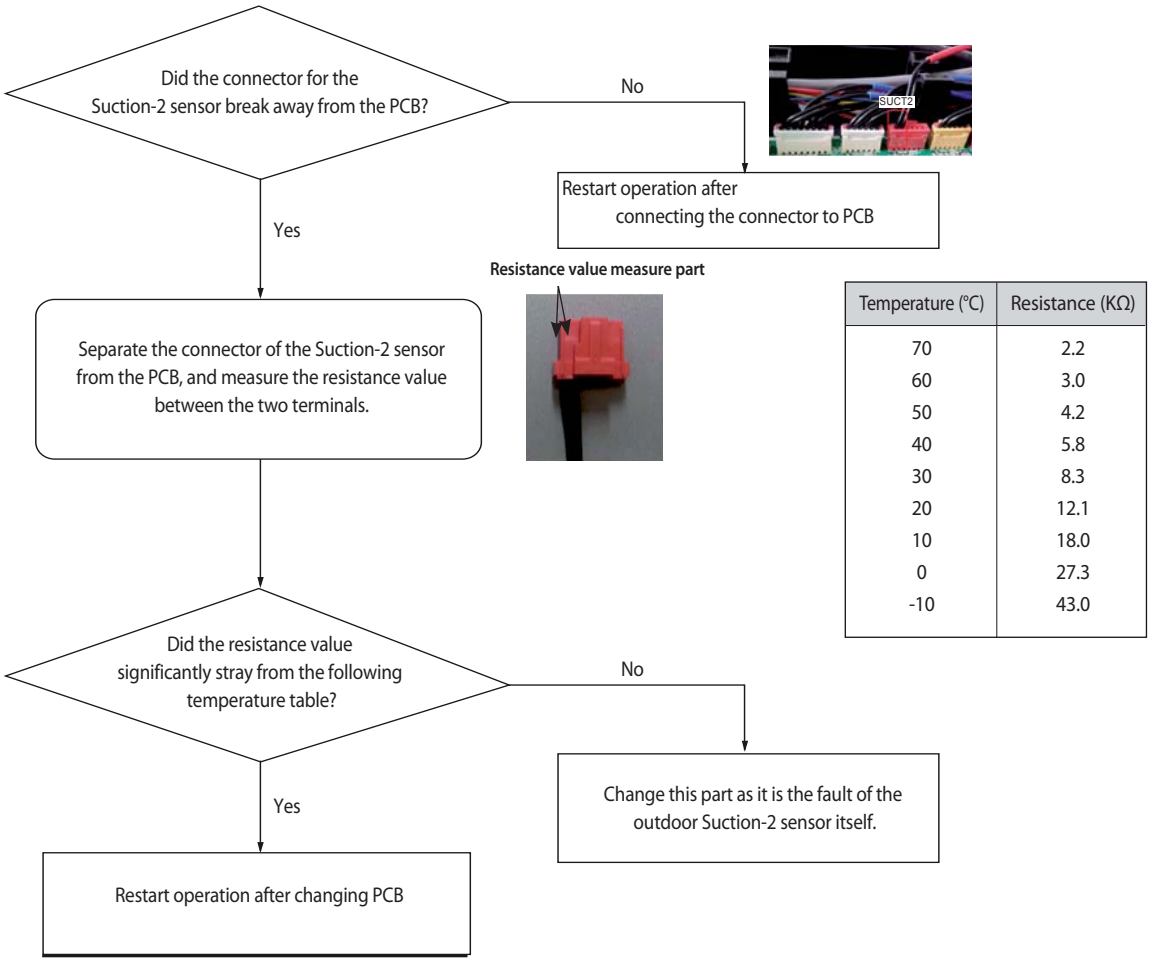
Yes

Restart operation after replace the PCB

4-3-29 Suction-2 Temperature Sensor Error (OPEN/SHORT)

Outdoor Unit Display	E323
Indoor Unit Display	Duct, Cassette (1/2 Way),Console, Celing: Operation ◑ / Defrost × / Timer × / Fan ◑ / Filter/MPI × Cassette (4/Mini4 Way): Operation ◑ / Defrost × / Timer ◑ / Filter × Wall-mounted (NeoForte): Operation ◑ / Timer × / Turbo × / 24℃ ◑ / 27℃ × ※ ●: ON ◑: Flash ×: OFF
Judgment Method	• Refer to the judgment method below.
Special Cause	• Disconnection or breakdown of relevant sensor

1. Inspection Method


Did the connector for the Suction-2 sensor break away from the PCB?
No
SUCT2
Restart operation after connecting the connector to PCB
Yes
Resistance value measure part
Separate the connector of the Suction-2 sensor from the PCB, and measure the resistance value between the two terminals.
Did the resistance value significantly stray from the following temperature table?
No
Change this part as it is the fault of the outdoor Suction-2 sensor itself.
Yes
Restart operation after changing PCB

Temperature (℃)	Resistance (KΩ)
70	2.2
60	3.0
50	4.2
40	5.8
30	8.3
20	12.1
10	18.0
0	27.3
-10	43.0

4-3-30 Measures of other outdoor unit error

<table>
<tr><td>Outdoor unit display</td><td>
E347 FAN2 wire unconnected error
E447 FAN1 wire unconnected error
E367 COMP.2 wire unconnected error
E467 COMP.1 wire unconnected error
E399 FAN2 PBA IPM temperature sensor error
E499 FAN1 PBA IPM temperature sensor error
E374 Inverter PBA2 IGBT temperature sensor error
E474 Inverter PBA1 IGBT temperature sensor error
</td></tr>
<tr><td>Indoor Unit Display</td><td>
<table>
<tr><th colspan="5">Duct, Cassette (1/2 Way),Console, Celing</th><th colspan="4">Cassette (4/Mini4 Way)</th><th colspan="5">Wall-mounted (NeoForte)</th></tr>
<tr><th>Operation</th><th>Defrost</th><th>Timer</th><th>Fan</th><th>Filter/MPI</th><th>Operation</th><th>Defrost</th><th>Timer</th><th>Filter</th><th>Operation</th><th>Timer</th><th>Turbo</th><th>24℃</th><th>27℃</th></tr>
<tr><td>×</td><td>×</td><td>◑</td><td>◑</td><td>◑</td><td>×</td><td>◑</td><td>◑</td><td>◑</td><td>×</td><td>×</td><td>◑</td><td>◑</td><td>◑</td></tr>
</table>
※ ●: ON ◑: Flash ×: OFF
</td></tr>
<tr><td>Judgment Method</td><td>· Refer to the measures code below.</td></tr>
<tr><td>Cause of problem</td><td>· Refer to the measures code below.</td></tr>
</table>

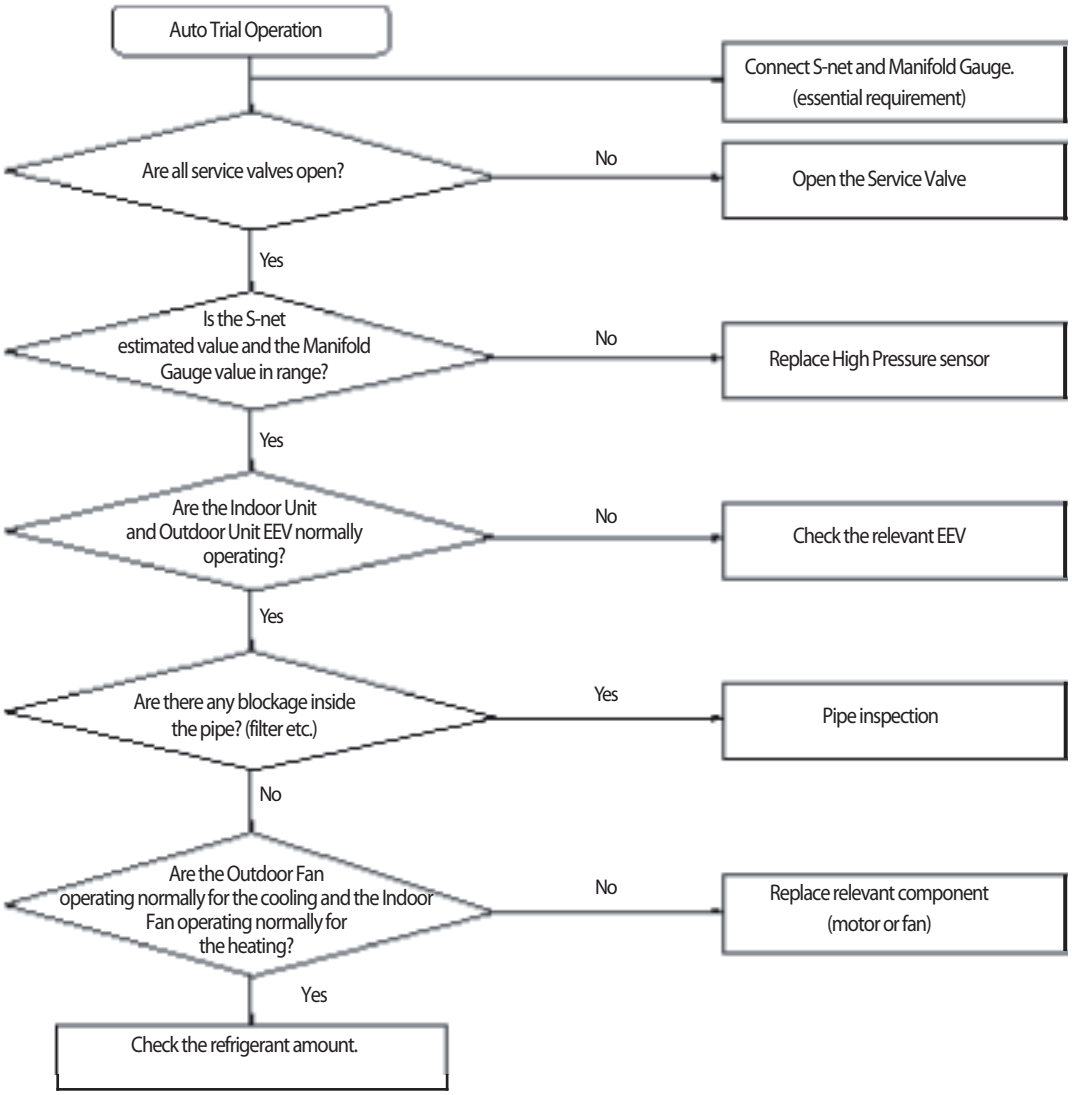
1. Measures by code

Code	Error	Measures
E347	FAN2 wire unconnected error	Check the connection of Fan motor and PBA (Replace PBA if there is no anomaly)
E447	FAN1 wire unconnected error	Check the connection of Fan motor and PBA (Replace PBA if there is no anomaly)
E367	COMP.2 wire unconnected error	Check the connection of COMP and Inverter PBA (Replace PBA if there is no anomaly)
E467	COMP.1 wire unconnected error	Check the connection of COMP and Inverter PBA (Replace PBA if there is no anomaly)
E399	FAN2 PBA IPM temperature sensor error	Replace FAN PBA
E499	FAN1 PBA IPM temperature sensor error	Replace FAN PBA
E374	Inverter PBA2 IGBT temperature sensor error	Replace Inverter PBA
E474	Inverter PBA1 IGBT temperature sensor error	Replace Inverter PBA

4-3-31 E407 : Comp. Down due to High Pressure Protection Control

Outdoor unit display	E407
Indoorunit display	Duct, Cassette (1/2 Way),Console, Celing: Operation, Defrost, Timer, Fan, Filter/MPI Cassette (4/Mini4 Way): Operation, Defrost, Timer, Filter Wall-mounted (NeoForte): Operation, Timer, Turbo, 24℃, 27℃ × × ◑ ◑ ◑ × ◑ ◑ ◑ × × ◑ ◑ ◑ ※ ● : ON ◑ : Flash × : OFF
Judgment Method	**Value of the high pressure sensor is detected at 40kg/cm² or more**
Cause of problem	**<Cooling Operation>** · Outdoor unit fan motor problem (constrained, defective) · Motor driver defective or wire is cut · Outdoor heat exchanger is contaminated. · Service valve locked/Fill refrigerant **<Heating Operation>** · Outdoor unit fan motor problem (constrained, defective) · Motor driver defective or wire is cut · Service valve locked/Excessive refrigerant

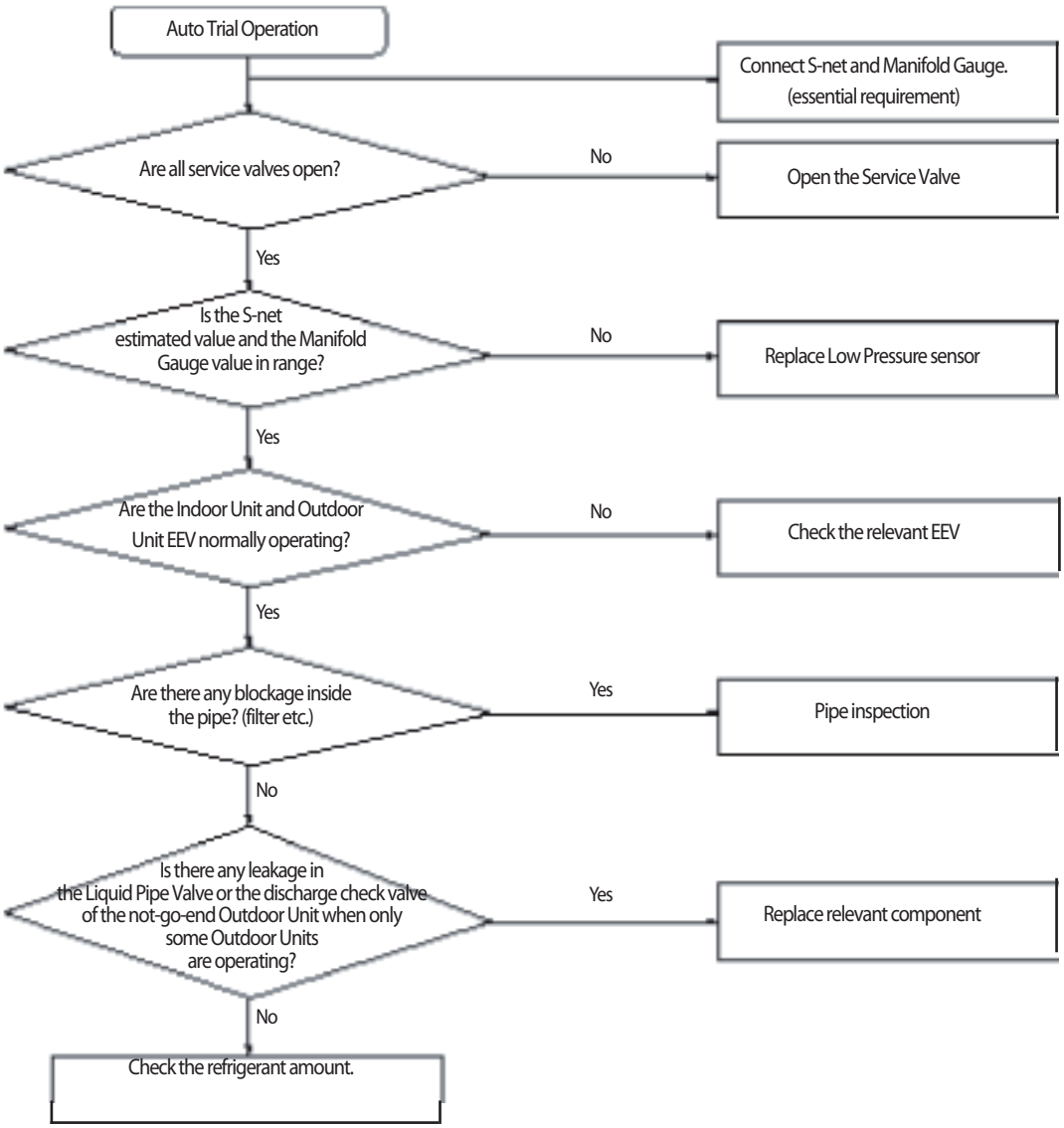
1. Cause of problem


Auto Trial Operation
Connect S-net and Manifold Gauge. (essential requirement)
Are all service valves open?
No
Open the Service Valve
Yes
Is the S-net estimated value and the Manifold Gauge value in range?
No
Replace High Pressure sensor
Yes
Are the Indoor Unit and Outdoor Unit EEV normally operating?
No
Check the relevant EEV
Yes
Are there any blockage inside the pipe? (filter etc.)
Yes
Pipe inspection
No
Are the Outdoor Fan operating normally for the cooling and the Indoor Fan operating normally for the heating?
No
Replace relevant component (motor or fan)
Yes
Check the refrigerant amount.

4-3-32 E410 : Comp. Down due to Low Pressure Protection Control

Outdoor unit display	E410
Indoorunit display	Duct, Cassette (1/2 Way),Console, Celing: Operation × / Defrost × / Timer ◑ / Fan ◑ / Filter/MPI ◑ Cassette (4/Mini4 Way): Operation × / Defrost ◑ / Timer ◑ / Filter ◑ Wall-mounted (NeoForte): Operation × / Timer × / Turbo ◑ / 24℃ ◑ / 27℃ ◑ ※ ● : ON ◑ : Flash × : OFF
Judgment Method	· Judgment Method : Inspection when the value of low pressure sensor is 1.8kg//cm^2, or less for air conditioning and 0.8kg//cm^2 for heating
Cause of problem	· Refrigerant shortage · Electronic expansion valve blocked · Service valve blocked · Low pressure sensor defective · Leakage of compressor discharge check valve of not-go-end outdoor unit · Error may be found when used in temperature range outside the conditions of use (Operating outside temperature at -20℃ or less for heating and operating outside temperature at -5℃ or less for Cooling)

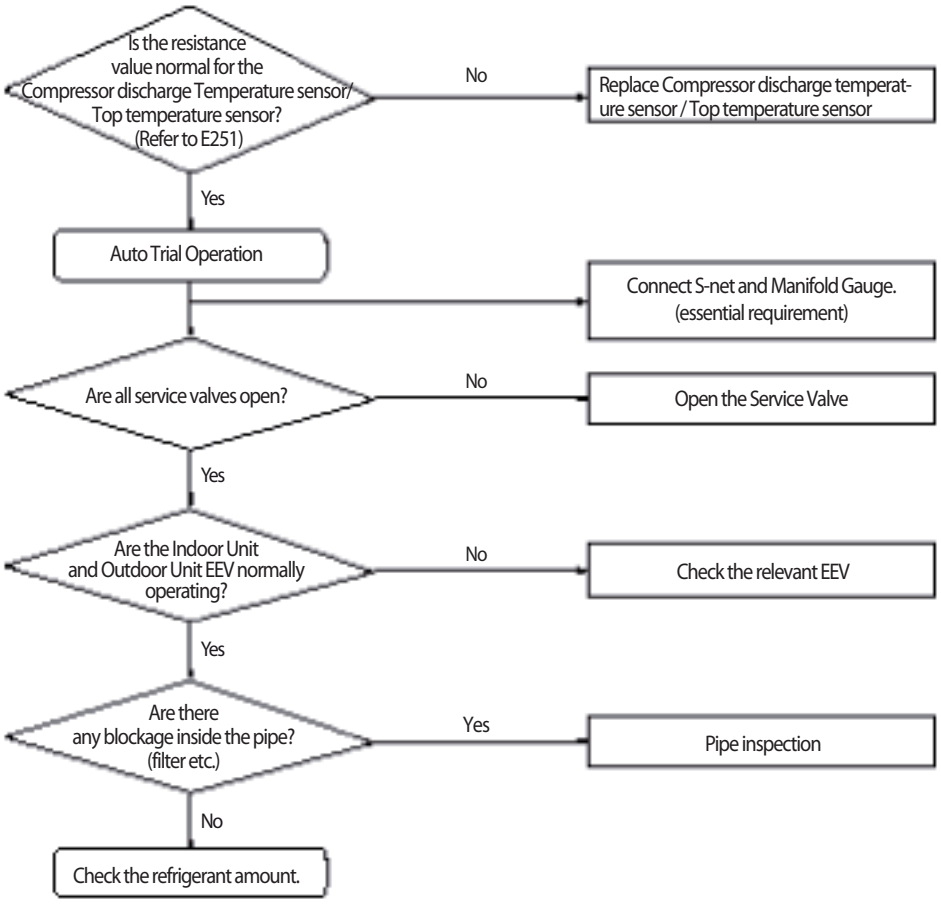
1. Cause of problem


Auto Trial Operation
Connect S-net and Manifold Gauge. (essential requirement)
Are all service valves open?
No
Open the Service Valve
Yes
Is the S-net estimated value and the Manifold Gauge value in range?
No
Replace Low Pressure sensor
Yes
Are the Indoor Unit and Outdoor Unit EEV normally operating?
No
Check the relevant EEV
Yes
Are there any blockage inside the pipe? (filter etc.)
Yes
Pipe inspection
No
Is there any leakage in the Liquid Pipe Valve or the discharge check valve of the not-go-end Outdoor Unit when only some Outdoor Units are operating?
Yes
Replace relevant component
No
Check the refrigerant amount.

4-3-33 E416 : Suspension of starting due to Compressor discharge temperature sensor / Top temperature sensor

Outdoor unit display	E416
Indoorunit display	Duct, Cassette (1/2 Way),Console, Celing: Operation × / Defrost × / Timer ◑ / Fan ◑ / Filter/MPI ◑ Cassette (4/Mini4 Way): Operation × / Defrost ◑ / Timer ◑ / Filter ◑ Wall-mounted (NeoForte): Operation × / Timer × / Turbo ◑ / 24℃ ◑ / 27℃ ◑ ※ ● : ON ◑ : Flash × : OFF
Judgment Method	· When value of Compressor discharge temperature sensor / Top temperature sensor is checked at 120• or more
Cause of problem	· Refrigerant shortage · Electronic expansion valve is blocked. · Service valve blocked · Defective discharge temperature sensor · TOP temperature sensor defective · Blocked pipe and defective · Leakage of compressor discharge check valve of not-go-end outdoor unit

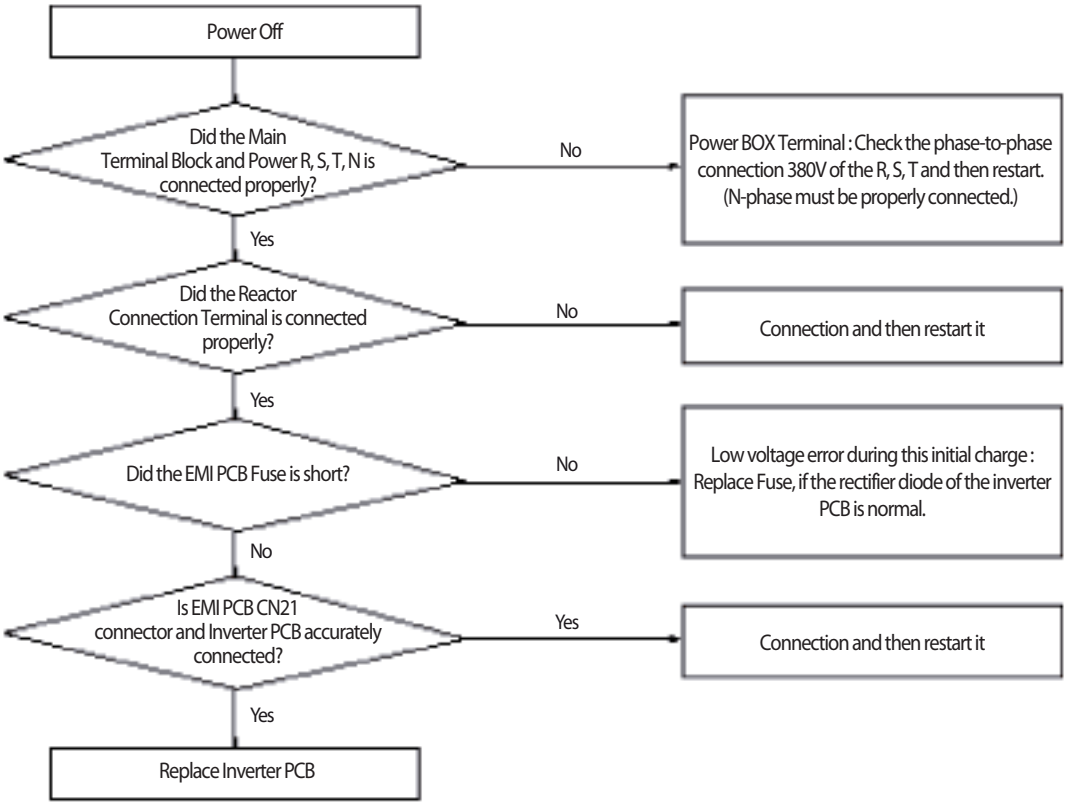
1. Cause of problem


Is the resistance value normal for the Compressor discharge Temperature sensor/ Top temperature sensor? (Refer to E251)
No
Replace Compressor discharge temperature sensor / Top temperature sensor
Yes
Auto Trial Operation
Connect S-net and Manifold Gauge. (essential requirement)
Are all service valves open?
No
Open the Service Valve
Yes
Are the Indoor Unit and Outdoor Unit EEV normally operating?
No
Check the relevant EEV
Yes
Are there any blockage inside the pipe? (filter etc.)
Yes
Pipe inspection
No
Check the refrigerant amount.

4-3-34 3-phase Input Wiring error

<table>
<tr><td>Outdoor unit display</td><td>E425</td></tr>
<tr><td>Indoorunit display</td><td>
<table>
<tr><td colspan="5">Duct, Cassette (1/2 Way),Console, Celing</td><td colspan="4">Cassette (4/Mini4 Way)</td><td colspan="5">Wall-mounted (NeoForte)</td></tr>
<tr><td>Operation</td><td>Defrost</td><td>Timer</td><td>Fan</td><td>Filter/MPI</td><td>Operation</td><td>Defrost</td><td>Timer</td><td>Filter</td><td>Operation</td><td>Timer</td><td>Turbo</td><td>24℃</td><td>27℃</td></tr>
<tr><td>×</td><td>×</td><td>◑</td><td>◑</td><td>◑</td><td>×</td><td>◑</td><td>◑</td><td>◑</td><td>×</td><td>×</td><td>◑</td><td>◑</td><td>◑</td></tr>
</table>
※ ●: ON ◑: Flash ×: OFF
</td></tr>
<tr><td>Judgment Method</td><td>. When turn on the power and check the status of the power from the inverter.
If the phase does not connect the power(no phase) : E425 or E466 (E366) is displayed (Air conditioner to maintain the normal state.)
However) N-phase must be properly connected.</td></tr>
<tr><td>Cause of problem</td><td>· Check the input wiring
· EMI Fuse short</td></tr>
</table>

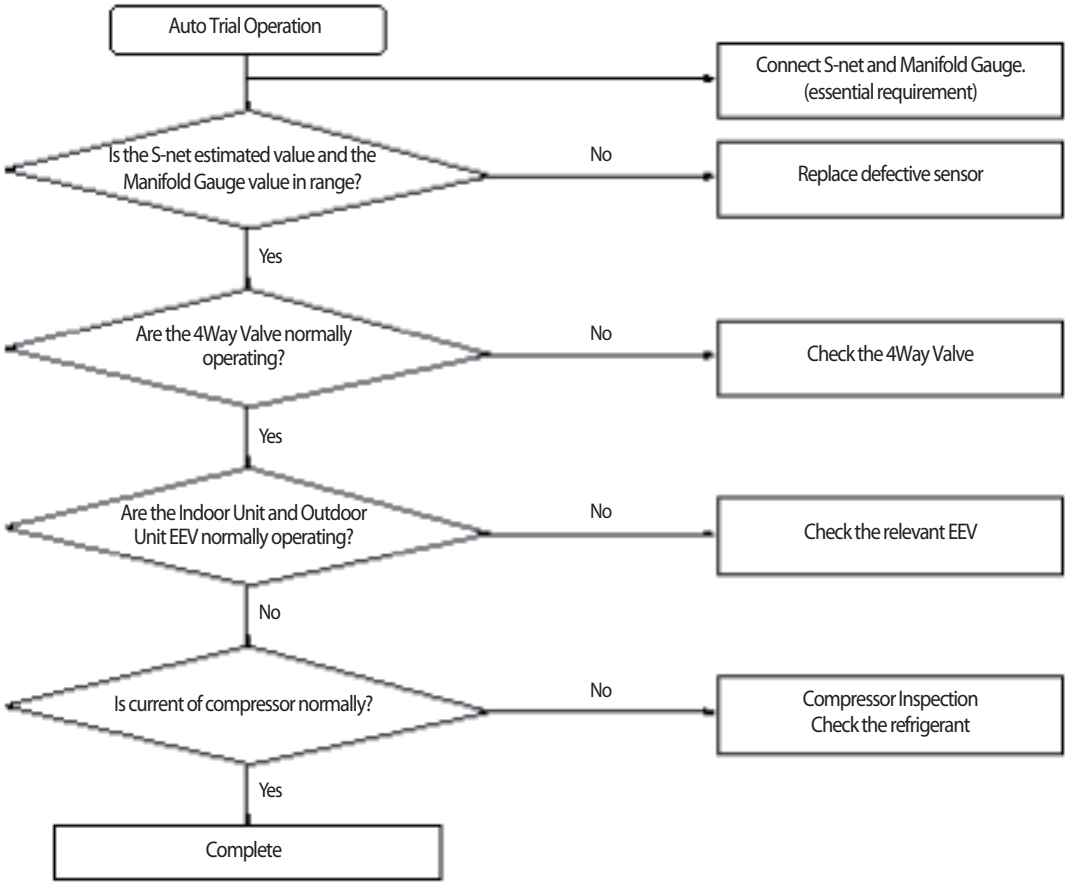
1. Cause of problem


Power Off
Did the Main Terminal Block and Power R, S, T, N is connected properly?
No
Power BOX Terminal : Check the phase-to-phase connection 380V of the R, S, T and then restart. (N-phase must be properly connected.)
Yes
Did the Reactor Connection Terminal is connected properly?
No
Connection and then restart it
Yes
Did the EMI PCB Fuse is short?
No
Low voltage error during this initial charge : Replace Fuse, if the rectifier diode of the inverter PCB is normal.
No
Is EMI PCB CN21 connector and Inverter PCB accurately connected?
Yes
Connection and then restart it
Yes
Replace Inverter PCB

4-3-35 E428 : Suspension of starting by abnormal compression ratio

<table>
<tr><td>Outdoor unit display</td><td>E428</td></tr>
<tr><td>Indoorunit display</td><td>
<table>
<tr><th colspan="5">Duct, Cassette (1/2 Way),Console, Celing</th><th colspan="4">Cassette (4/Mini4 Way)</th><th colspan="5">Wall-mounted (NeoForte)</th></tr>
<tr><th>Operation</th><th>Defrost</th><th>Timer</th><th>Fan</th><th>Filter/MPI</th><th>Operation</th><th>Defrost</th><th>Timer</th><th>Filter</th><th>Operation</th><th>Timer</th><th>Turbo</th><th>24℃</th><th>27℃</th></tr>
<tr><td>×</td><td>×</td><td>◑</td><td>◑</td><td>◑</td><td>×</td><td>◑</td><td>◑</td><td>◑</td><td>×</td><td>×</td><td>◑</td><td>◑</td><td>◑</td></tr>
</table>
※ ● : ON ◑ : Flash ×: OFF
</td></tr>
<tr><td>Judgment Method</td><td>· Compression ratio [(High pressure+1.03)/(Low pressure+1.03)] less than 1.5 and lasts for 10 minutes or more
· Differential pressure (high pressure - low pressure) less than 0.4 MPa.g and lasts for 10 minutes or more</td></tr>
<tr><td>Cause of problem</td><td>· Indoor and Outdoor EEV breakdown
· 4Way Valve breakdown
· High and Low pressure sensor defective
· Refrigerant shortage</td></tr>
</table>

1. Cause of problem



4-3-36 EVI EEV Open error

<table>
<tr><td>Outdoor unit display</td><td>E438</td></tr>
<tr><td>Indoorunit display</td><td>
<table>
<tr><th colspan="5">Duct, Cassette (1/2 Way),Console, Celing</th><th colspan="4">Cassette (4/Mini4 Way)</th><th colspan="5">Wall-mounted (NeoForte)</th></tr>
<tr><th>Operation</th><th>Defrost</th><th>Timer</th><th>Fan</th><th>Filter/MPI</th><th>Operation</th><th>Defrost</th><th>Timer</th><th>Filter</th><th>Operation</th><th>Timer</th><th>Turbo</th><th>24℃</th><th>27℃</th></tr>
<tr><td>×</td><td>×</td><td>◑</td><td>◑</td><td>◑</td><td>×</td><td>◑</td><td>◑</td><td>◑</td><td>×</td><td>×</td><td>◑</td><td>◑</td><td>◑</td></tr>
</table>
※ ● : ON ◑ : Flash × : OFF
</td></tr>
<tr><td>Judgment Method</td><td>. DSH <10 ℃, EVI Out-in <= 0℃ & frequency> 65Hz 40 minutes maintaining</td></tr>
<tr><td>Cause of problem</td><td>. EVI EEV and Intercooler leakage, excessive refrigerant amount, Outdoor Check Valve inserted opposite.
. Indoor Unit EEV leakage, direct connection between Indoor Liquid Pipe and the Gas Pipe.</td></tr>
</table>

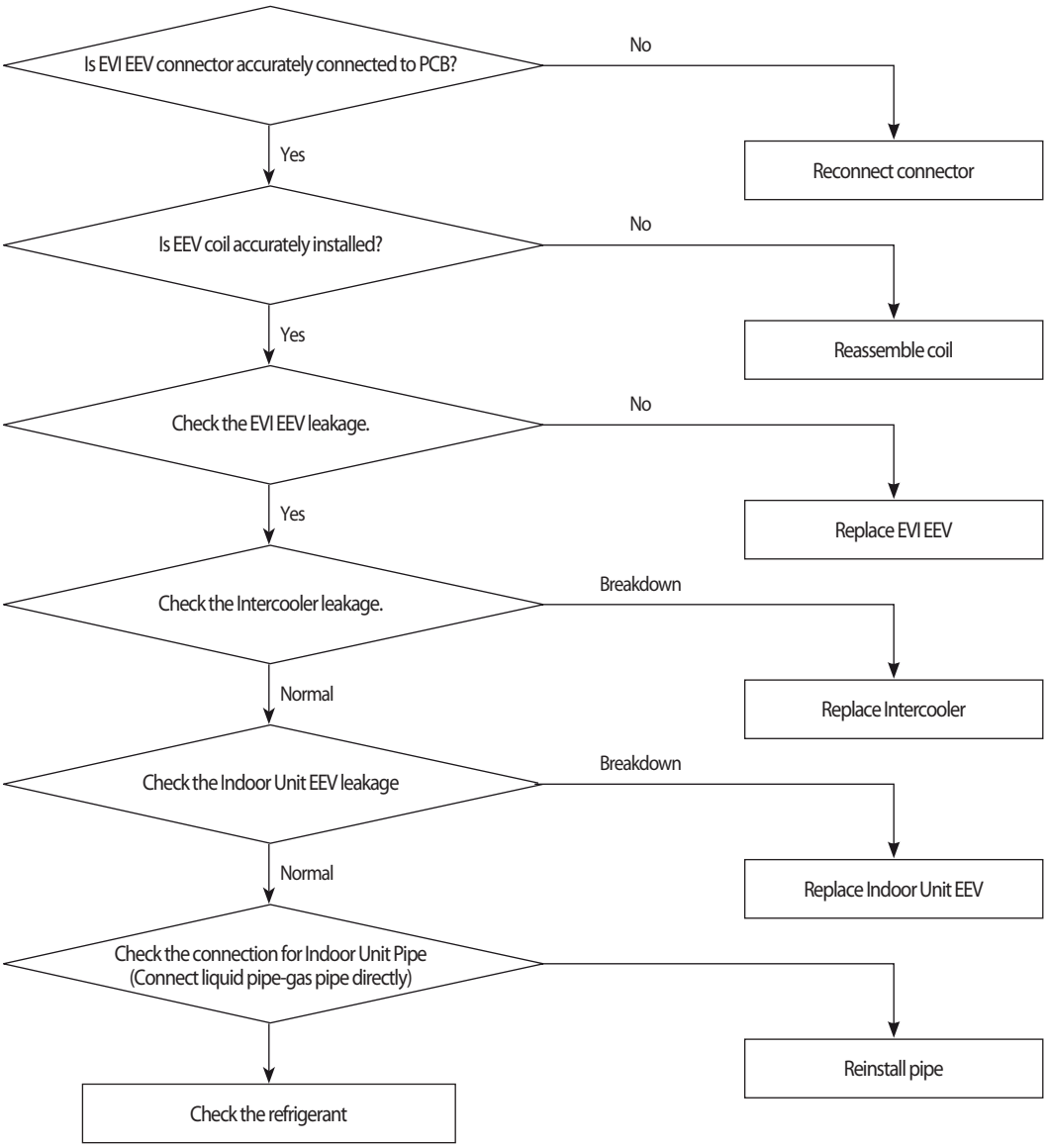
※ Indoor Unit EEV leakage confirmation(In case it is normal, the EVA In and Out temperatures for the blast may rise.)

- Operate cooling in one room any of the selected indoor unit. (Remainder Indoor Unit can confirm simply at the blast operation.)
- In case it is normal, the EVA IN/OUT temperature of indoor unit that is on blast operation within 5 minutes is ascending to value that approaching in indoor temperature.

(※ Setting as opposed to the indoor unit blast operation and cooling operation functions of the indoor unit, and then check again.)

※ If cooling operation is operated for low temperature with excessive refrigerant amount, then the DSH may descend.

1. Cause of problem

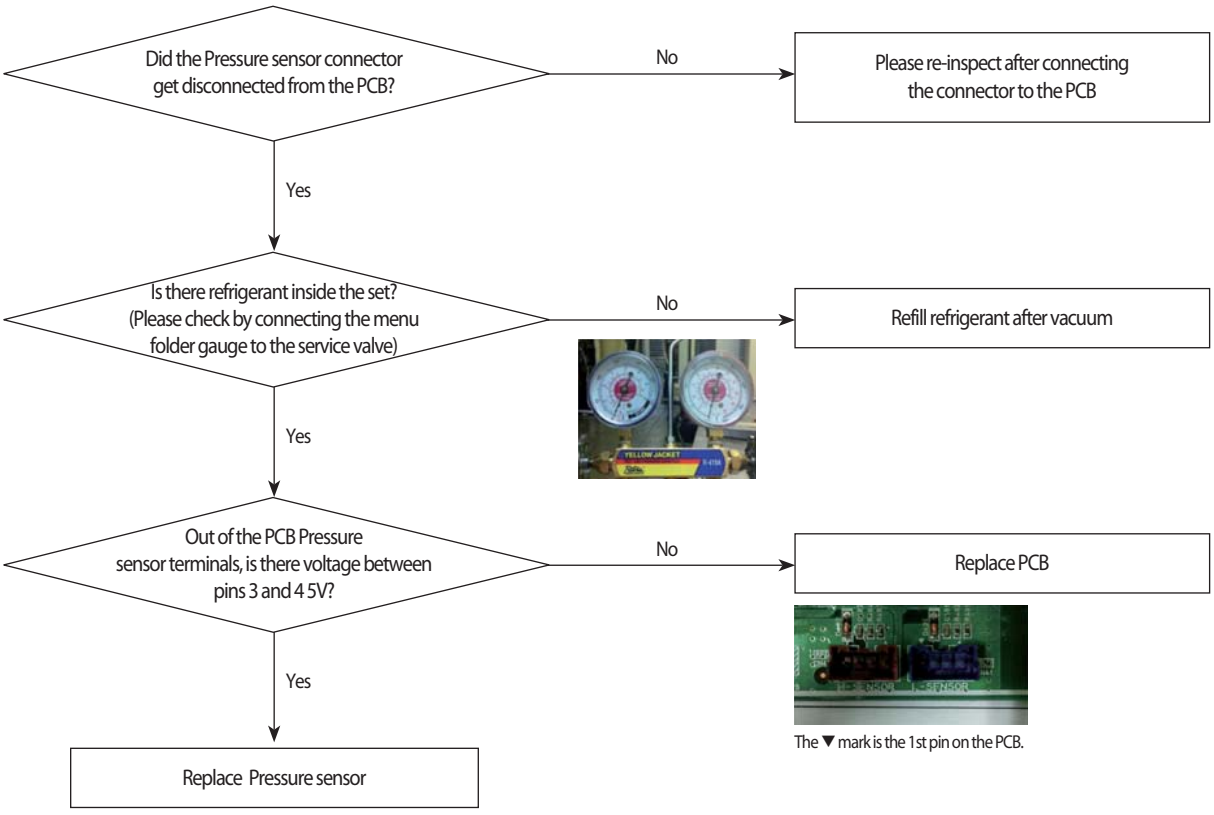


4-3-37 Refrigerant leakage error

Outdoor unit display	E439 (Refrigerant leakage judgment before starting) E443 (When start, refrigerant leakage judgment)
Judgment Method	· Before starting : Before compressor starting after system halt 2 minutes (High & low pressure sensor Open / Short error occurs and 1kg/cm2 or less) · When start : When the high pressure sensor value(cooling 3.1kg/ ㎠ , heating 2.2kg/ ㎠) is detection continuously for 3 seconds
Cause of problem	· Refrigerant leakage and shortage · Disconnection or breakdown of high & low pressure sensor

1. Pressure sensor Open/Short error determination method
   1) Identifies from when power is supplied or 2 minutes after RESET, and only when set is stopped.
   2) An Open/Short error will occur if the input voltage standard range of 0.5V ~ 4.95V is exceeded.

2. Inspection Method


Did the Pressure sensor connector get disconnected from the PCB?
No
Please re-inspect after connecting the connector to the PCB
Yes
Is there refrigerant inside the set? (Please check by connecting the menu folder gauge to the service valve)
No
Refill refrigerant after vacuum
Yes
Out of the PCB Pressure sensor terminals, is there voltage between pins 3 and 4 5V?
No
Replace PCB
Yes
Replace Pressure sensor
The ▼ mark is the 1st pin on the PCB.

4-3-38 Prevention of heating / cooling operation due to outdoor temperature

<table>
<tr><td>Outdoor unit display</td><td>E440 (Prevention of heating operation due to high temperature of outdoor)
E441 (Prevention of cooling operation due to low temperature of outdoor)</td></tr>
<tr><td>Indoor Unit Display</td><td>
<table>
<tr><th colspan="5">Duct, Cassette (1/2 Way),Console, Celing</th><th colspan="4">Cassette (4/Mini4 Way)</th><th colspan="5">Wall-mounted (NeoForte)</th></tr>
<tr><th>Operation</th><th>Defrost</th><th>Timer</th><th>Fan</th><th>Filter/MPI</th><th>Operation</th><th>Defrost</th><th>Timer</th><th>Filter</th><th>Operation</th><th>Timer</th><th>Turbo</th><th>24℃</th><th>27℃</th></tr>
<tr><td>×</td><td>×</td><td>◑</td><td>◑</td><td>◑</td><td>×</td><td>◑</td><td>◑</td><td>◑</td><td>×</td><td>×</td><td>◑</td><td>◑</td><td>◑</td></tr>
</table>
※ ● : ON ◑ : Flash × : OFF
</td></tr>
<tr><td>Judgment Method</td><td>· Heating operation : When the outdoor temperature is more than 30℃
· Cooling operation : When the outdoor temperature is less than -15℃</td></tr>
<tr><td>Cause of problem</td><td>· System protection operation status (Is not breakdown)</td></tr>
</table>

4-3-39 Prevention of heating refrigerant charge due to outdoor temperature

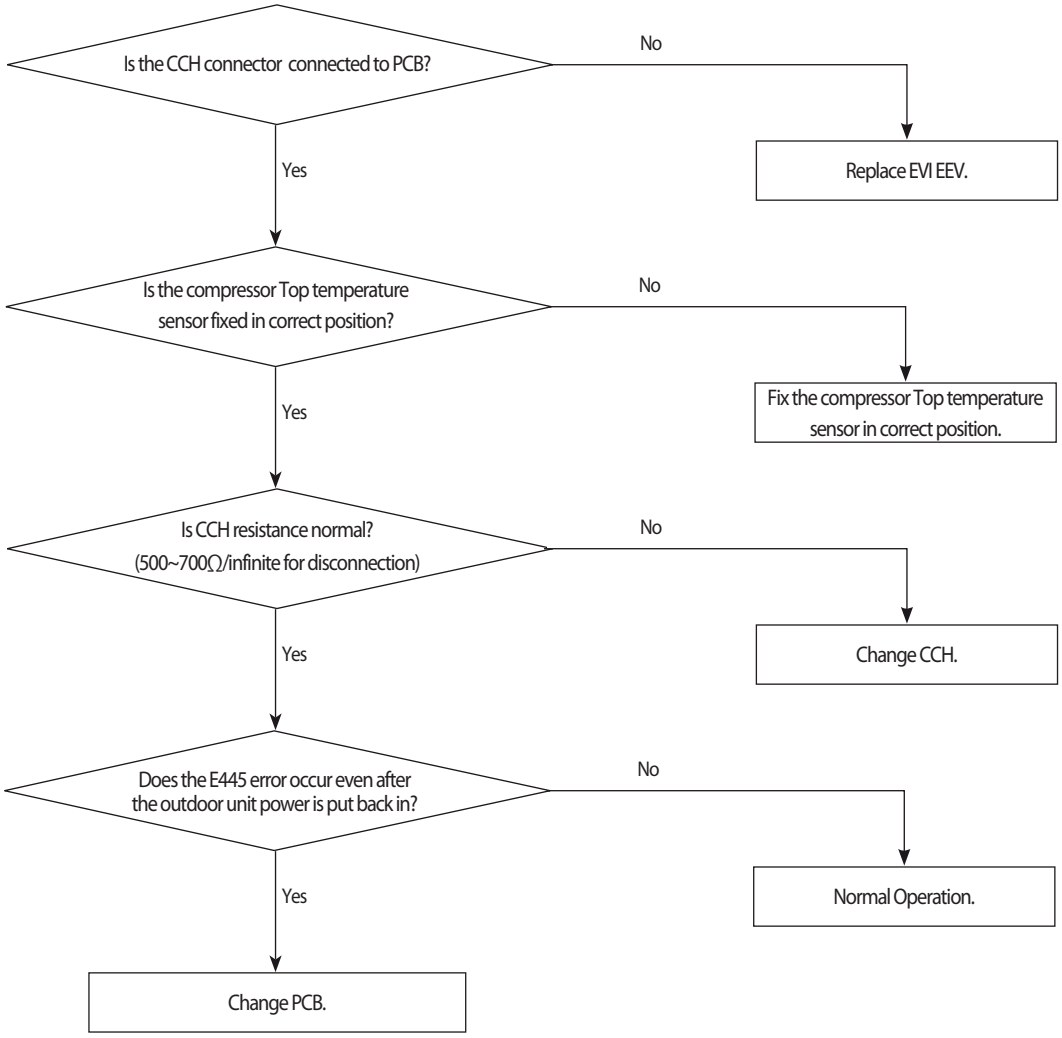
<table>
<tr><td>Outdoor Unit Display</td><td>E442</td></tr>
<tr><td>Indoor Unit Display</td><td>
<table>
<tr><td colspan="5">Duct, Cassette (1/2 Way),Console, Celing</td><td colspan="4">Cassette (4/Mini4 Way)</td><td colspan="5">Wall-mounted (NeoForte)</td></tr>
<tr><td>Operation</td><td>Defrost</td><td>Timer</td><td>Fan</td><td>Filter/MPI</td><td>Operation</td><td>Defrost</td><td>Timer</td><td>Filter</td><td>Operation</td><td>Timer</td><td>Turbo</td><td>24℃</td><td>27℃</td></tr>
<tr><td>×</td><td>×</td><td>◑</td><td>◑</td><td>◑</td><td>×</td><td>◑</td><td>◑</td><td>◑</td><td>×</td><td>×</td><td>◑</td><td>◑</td><td>◑</td></tr>
</table>
※ ● : ON ◑ : Flash ×: OFF
</td></tr>
<tr><td>Judgment Method</td><td>• When the heating refrigerant charge : If the outdoor temperature is more than 15℃</td></tr>
<tr><td>Special Cause</td><td>• System protection operation status (Is not breakdown)</td></tr>
</table>

4-3-40 CH wire breaking error

<table>
<tr><td>Outdoor unit display</td><td>E445</td></tr>
<tr><td>Indoorunit display</td><td>
<table>
<tr><td colspan="5">Duct, Cassette (1/2 Way),Console, Celing</td><td colspan="4">Cassette (4/Mini4 Way)</td><td colspan="5">Wall-mounted (NeoForte)</td></tr>
<tr><td>Operation</td><td>Defrost</td><td>Timer</td><td>Fan</td><td>Filter/MPI</td><td>Operation</td><td>Defrost</td><td>Timer</td><td>Filter</td><td>Operation</td><td>Timer</td><td>Turbo</td><td>24℃</td><td>27℃</td></tr>
<tr><td>×</td><td>×</td><td>◑</td><td>◑</td><td>◑</td><td>×</td><td>◑</td><td>◑</td><td>◑</td><td>×</td><td>×</td><td>◑</td><td>◑</td><td>◑</td></tr>
</table>
※ ● : ON ◑ : Flash ×: OFF
</td></tr>
<tr><td>Judgment Method</td><td>. Refer to the judgment method below.</td></tr>
<tr><td>Cause of problem</td><td>. CCH Connector PCB is not connected / Compressor Top sensor breakaway / Own problem of CCH</td></tr>
</table>

1. Judgment Method
   ① Current compressor Top temperature - Tini < 2℃ (※Tini : Power on or temperature of initial compressor Top after reset)
   ② Current compressor Top temperature - Outdoor temperature < 2℃
   ③ Outdoor temperature < 30℃
   ④ UP state

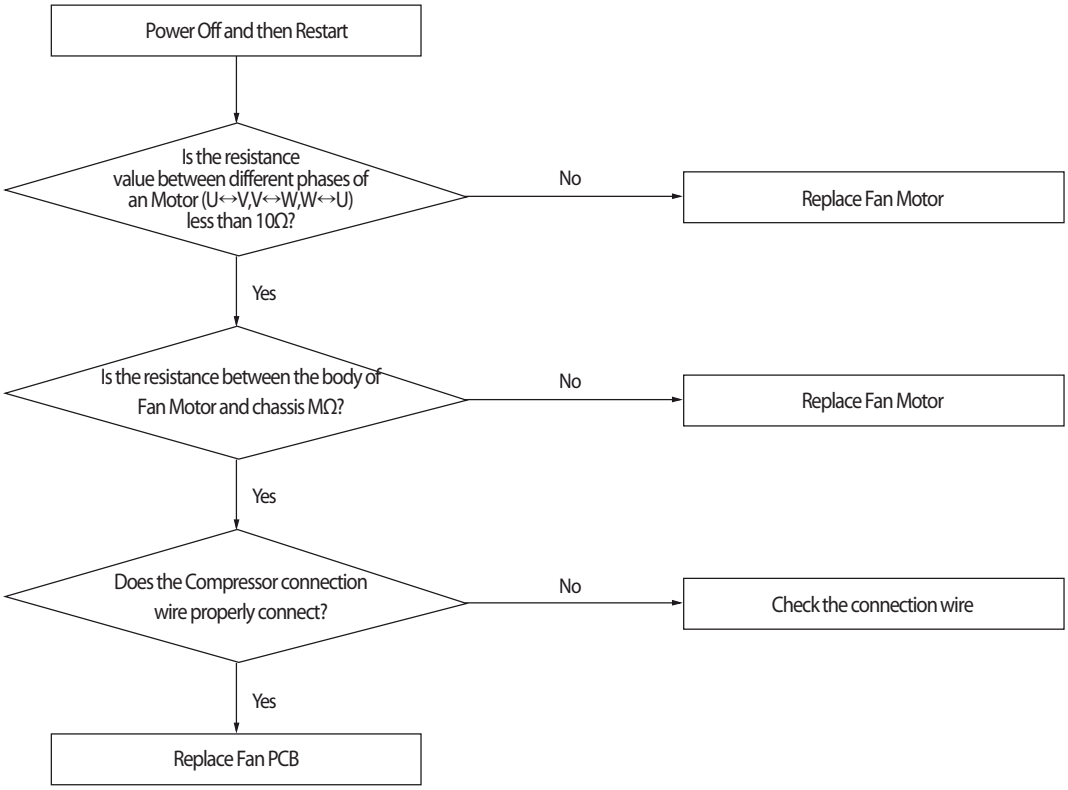
※ If the above condition is satisfied at the same time : Mark the CCH wire breaking error (E445)



4-3-41 Fan starting error

Outdoor unit display	E446 (FAN PCB(FAN1)) E346 (FAN PCB(FAN2))
Judgment Method	· Startup, and then if the speed increase is not normally. · Detected by H/W or S/W
Cause of problem	· Compressor connection error · Defective Compressor · Defective PCB

1. Cause of problem


Power Off and then Restart
Is the resistance value between different phases of an Motor (U↔V,V↔W,W↔U) less than 10Ω?
No
Replace Fan Motor
Yes
Is the resistance between the body of Fan Motor and chassis MΩ?
No
Replace Fan Motor
Yes
Does the Compressor connection wire properly connect?
No
Check the connection wire
Yes
Replace Fan PCB

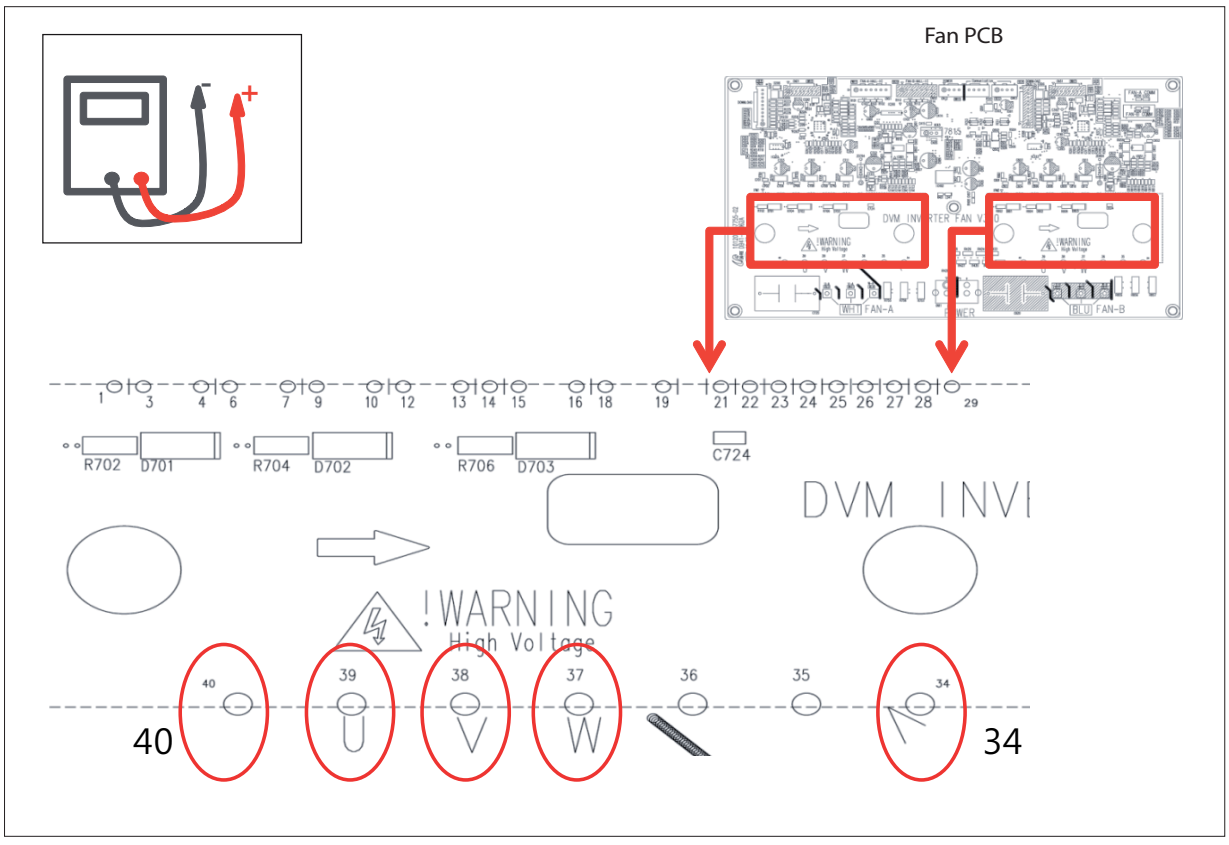
IPM breakdown diagnostics (FAN PCB)

1. Preparations before checking
   1) Power Off
   2) IPM failure, discharge mode may not work properly. Therefore, wait more than 15 minutes after the Power Off.
   3) Remove all of the Fan PCB connectors. (Comp connector included)
   4) Prepare the digital multi tester.

2. Inspection Method
   1) Refer to Figure1 and Table1, respectively the resistance value and diode voltage value measure.
   2) According to the criterion in Table 1 to determine whether the failure of IPM.

Division	Measured Point		Criterion	Remark
	+	-		
Measure the resistance values	40	U	More than 3 MΩ	Measurement error can occur for reasons such as the initial measurement condenser discharge. Measured over at least three times.
	40	V		
	40	W		
	U	34		
	V	34		
	W	34		
Measure the diode voltage values	U	40	0.3~0.7V	
	V	40		
	W	40		
	34	U		
	34	V		
	34	W		

< Table 1 >

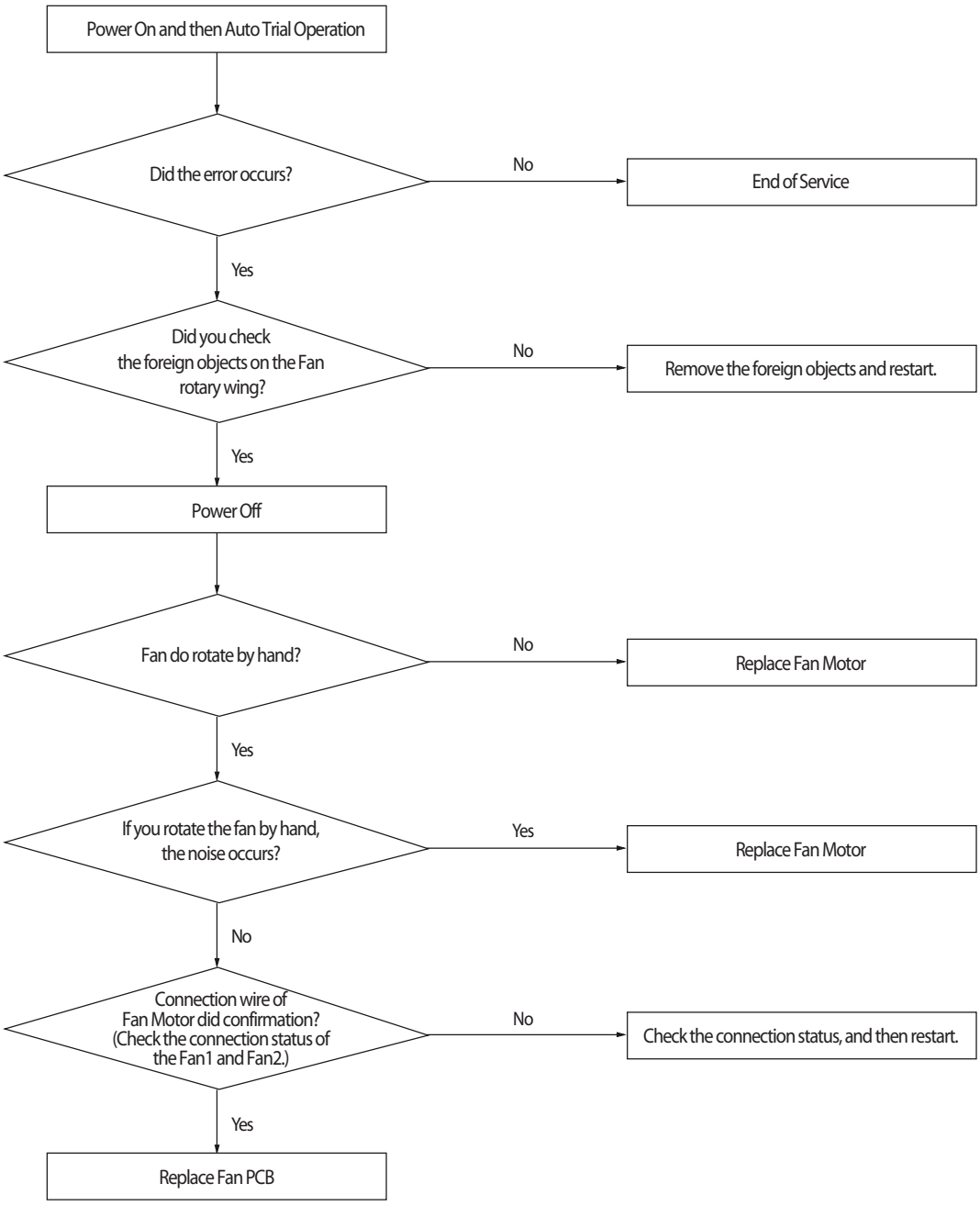


< Figure 1 >

4-3-42 Fan lock error

Outdoor unit display	E448 (FAN PCB(FAN1)) E348 (FAN PCB(FAN2))
Judgment Method	· Is checked symptoms by phase current of Fan Motor.
Cause of problem	· Fan Motor connection error. · Defective Fan · Defective PCB

1. Cause of problem



4-3-43 Momentary Blackout error

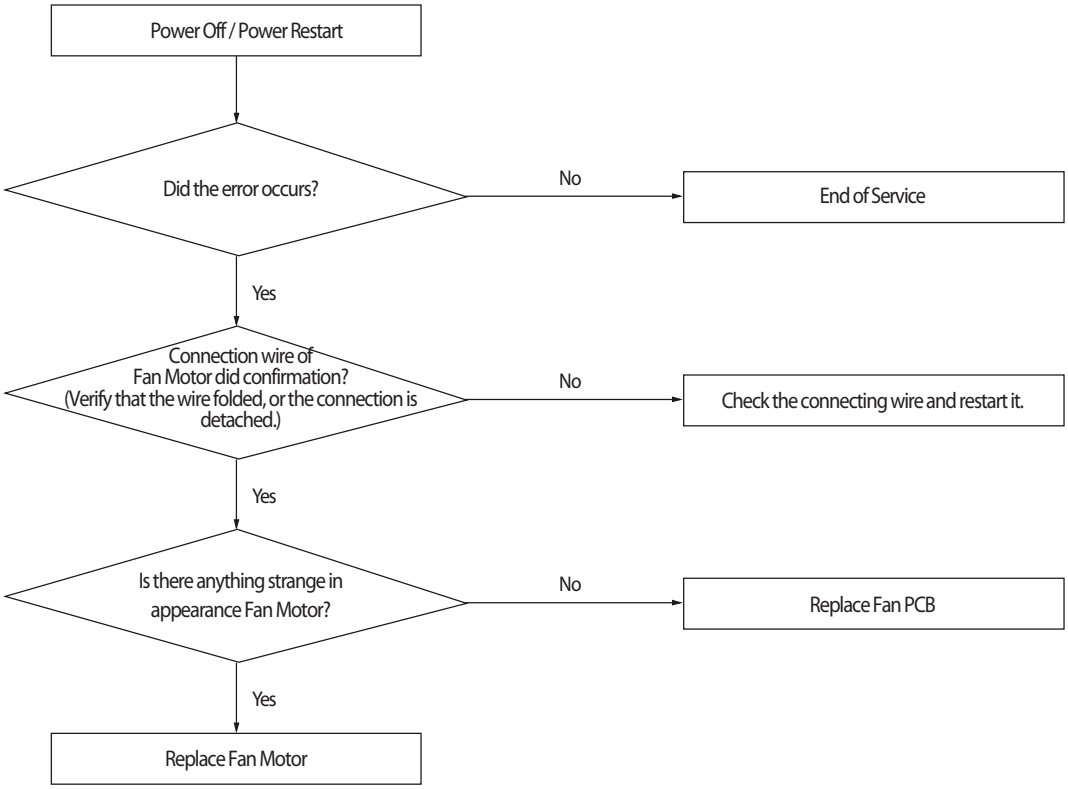
<table>
<tr><td>Outdoor unit display</td><td>E452</td></tr>
<tr><td>Indoorunit display</td><td>
<table>
<tr><th colspan="5">Duct, Cassette (1/2 Way),Console, Celing</th><th colspan="4">Cassette (4/Mini4 Way)</th><th colspan="5">Wall-mounted (NeoForte)</th></tr>
<tr><th>Operation</th><th>Defrost</th><th>Timer</th><th>Fan</th><th>Filter/MPI</th><th>Operation</th><th>Defrost</th><th>Timer</th><th>Filter</th><th>Operation</th><th>Timer</th><th>Turbo</th><th>24℃</th><th>27℃</th></tr>
<tr><td>×</td><td>×</td><td>◑</td><td>◑</td><td>◑</td><td>×</td><td>◑</td><td>◑</td><td>◑</td><td>×</td><td>×</td><td>◑</td><td>◑</td><td>◑</td></tr>
</table>
※ ● : ON ◑ : Flash ×: OFF
</td></tr>
<tr><td>Judgment Method</td><td>· Momentary stop of compressor due to momentary blackout.</td></tr>
<tr><td>Cause of problem</td><td>· Momentary stop of compressor due to momentary blackout.</td></tr>
</table>

1. Precautions : Replace Hub PCB or Main Hub Connection wire.

4-3-44 Outdoor Fan Motor overheating

Outdoor unit display	E453 (FAN PCB(FAN1)) E353 (FAN PCB(FAN2))
Judgment Method	· Overheating due to the internal sensor of the Fan Motor.
Cause of problem	· Defective connection wire · Defective Fan Motor · Defective PCB · Defective installation conditions

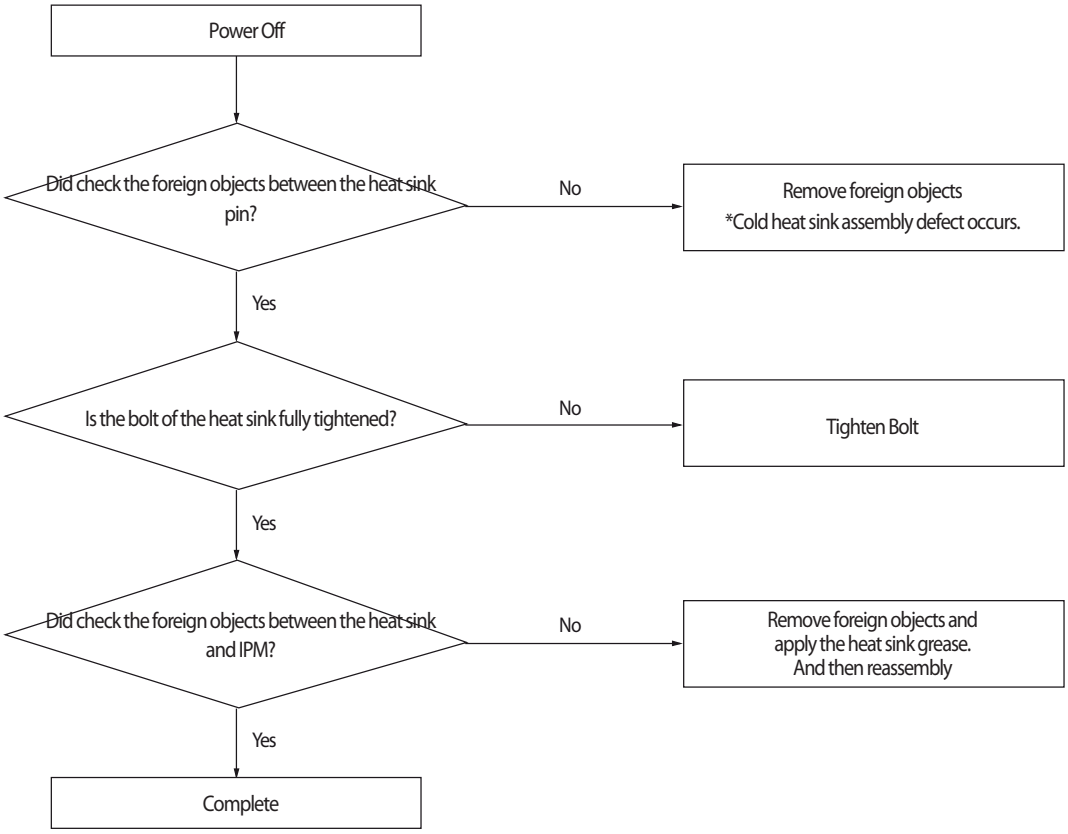
1. Cause of problem


Power Off / Power Restart
Did the error occurs?
No
End of Service
Yes
Connection wire of Fan Motor did confirmation? (Verify that the wire folded, or the connection is detached.)
No
Check the connecting wire and restart it.
Yes
Is there anything strange in appearance Fan Motor?
No
Replace Fan PCB
Yes
Replace Fan Motor

4-3-45 Fan IPM Overheat error

Outdoor unit display	E455 (FAN1 PCB) E355 (FAN2 PCB)
Judgment Method	· IPM internal temperature more than 85℃ (E455, E355)
Cause of problem	· Heat sink and IPM assembly defective. · Defective heat sink cooling

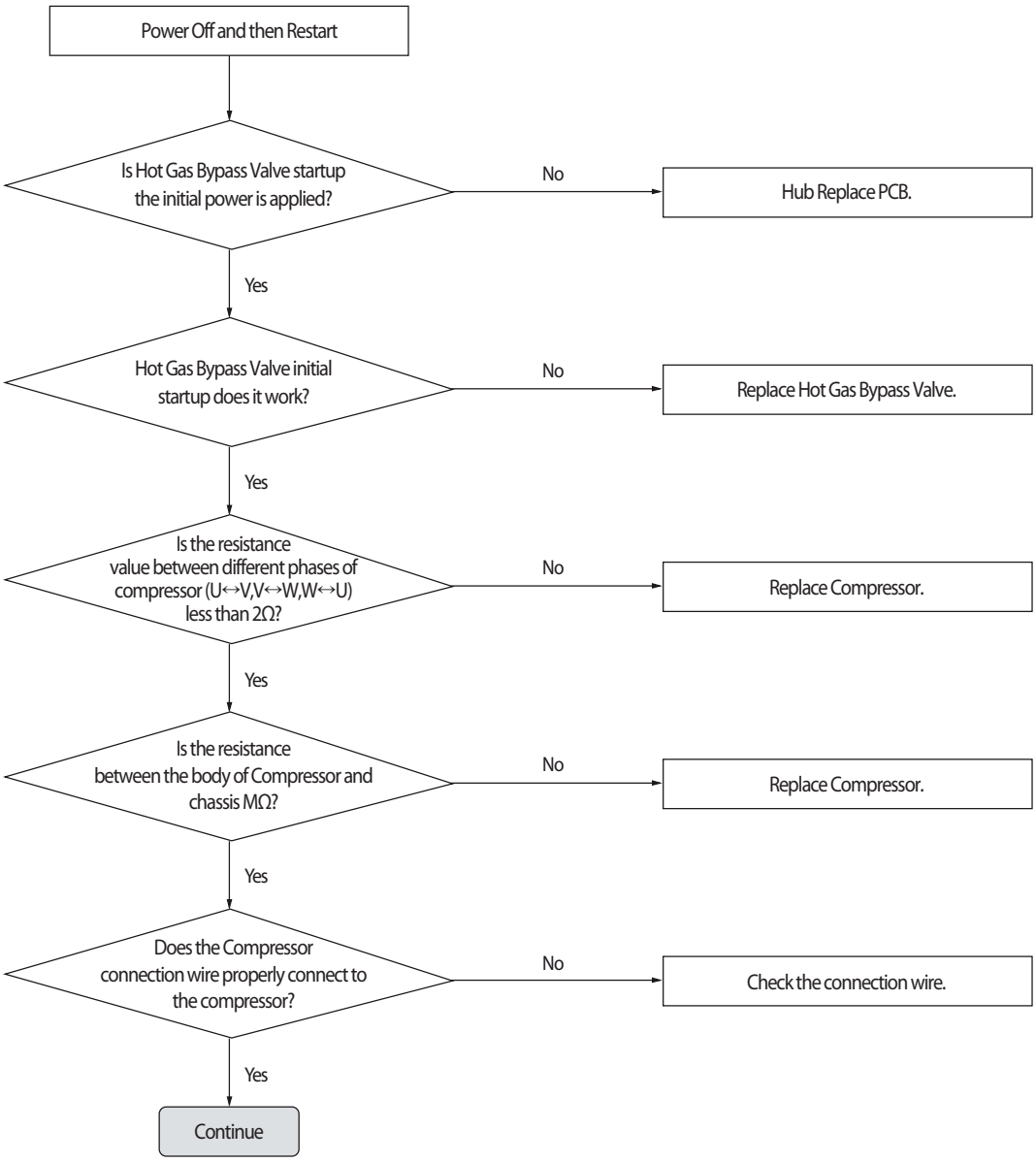
1. Cause of problem


Power Off
Did check the foreign objects between the heat sink pin?
No
Remove foreign objects
*Cold heat sink assembly defect occurs.
Yes
Is the bolt of the heat sink fully tightened?
No
Tighten Bolt
Yes
Did check the foreign objects between the heat sink and IPM?
No
Remove foreign objects and apply the heat sink grease. And then reassembly
Yes
Complete

4-3-46 Compressor starting error

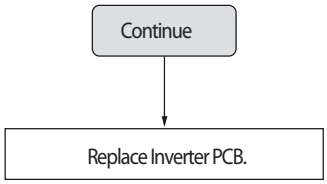
Outdoor unit display	E461 (INVERTER1 PCB) E361 (INVERTER2 PCB)
Judgment Method	· Startup, and then if the speed increase is not normally. · Detected by H/W or S/W.
Cause of problem	· Compressor connection error · Defective Compressor · Defective PCB

1. Cause of problem

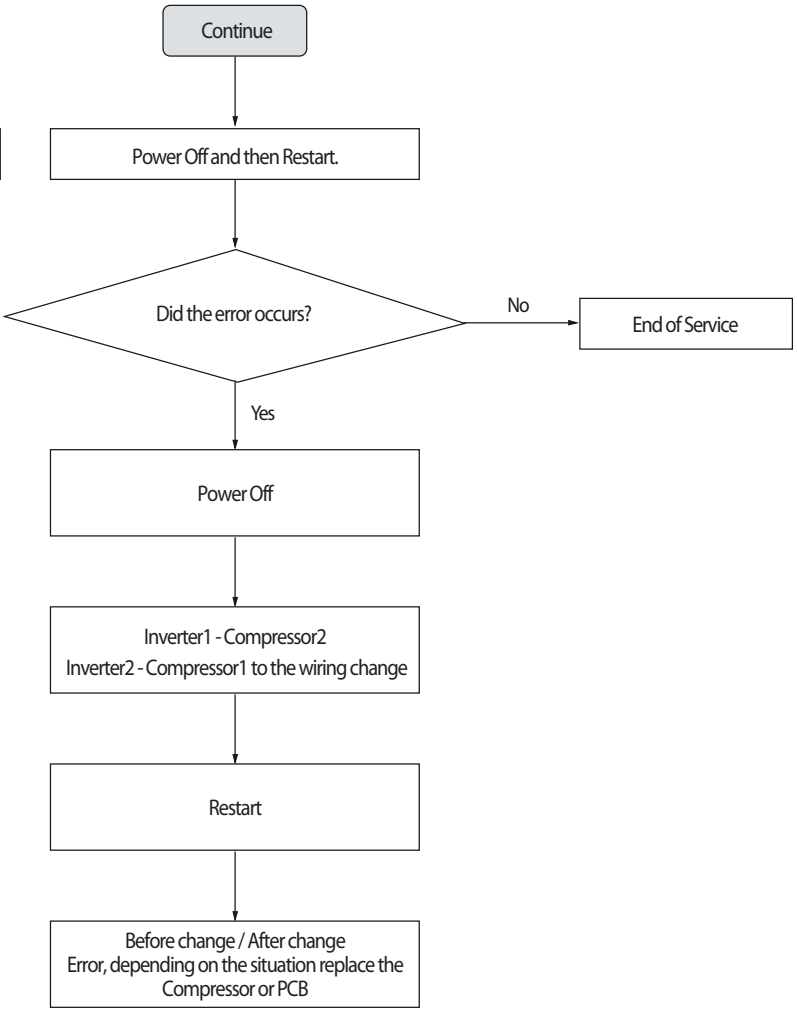


Starting error (cont.)

■ **Compressor applied one**



■ **Compressor applied two**

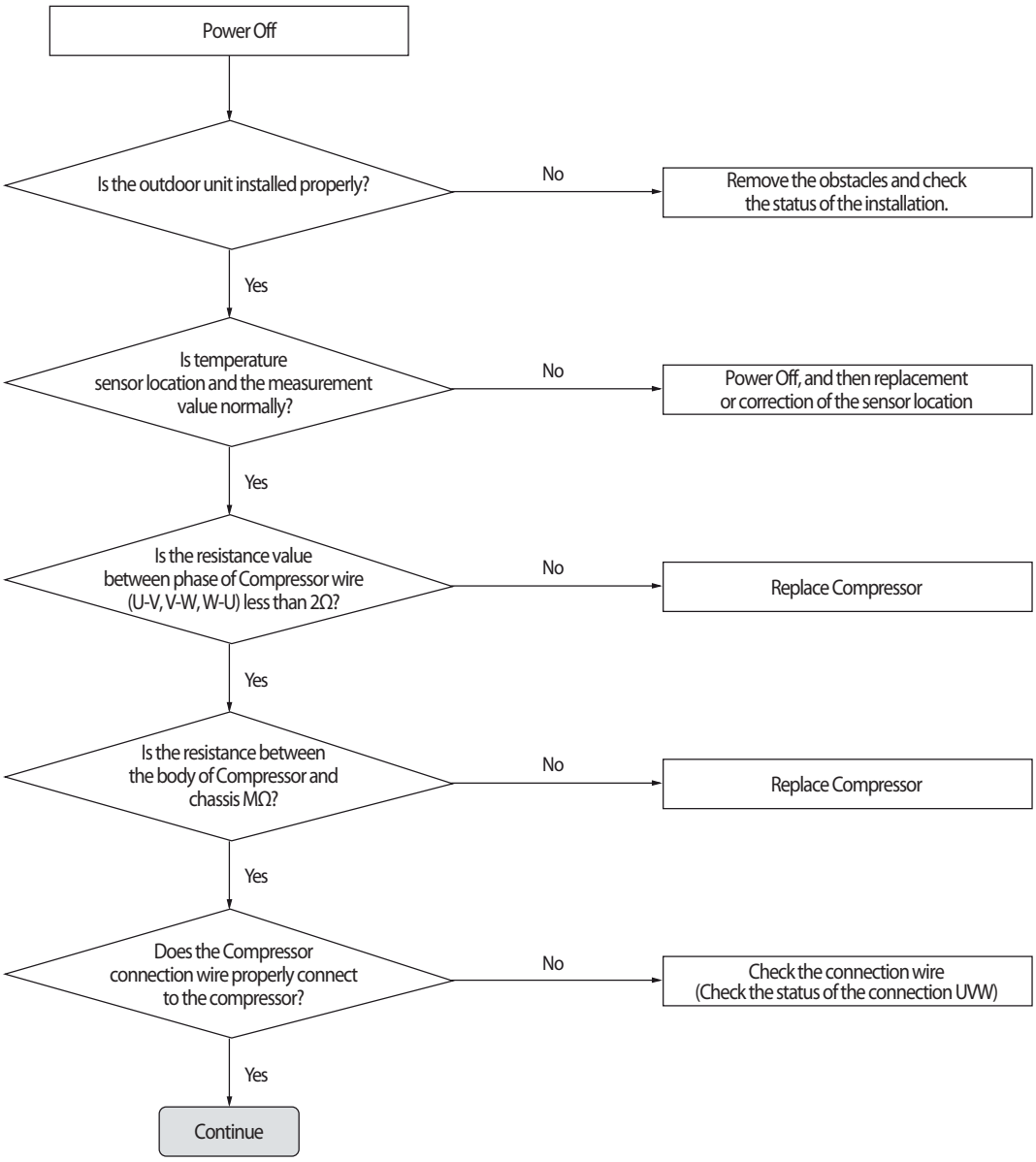


Before change	After change	Measure
Error of No.1 Compressor	Error of No.1 Compressor	Replace No.1 Compressor
Error of No.1 Compressor	Error of No.2 Compressor	Replace No.1 Inverter PCB
Error of No.2 Compressor	Error of No.2 Compressor	Replace No.2 Compressor
Error of No.2 Compressor	Error of No.1 Compressor	Replace No.2 Inverter PCB

4-3-47 Inverter Overcurrent error

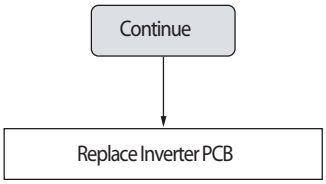
Outdoor unit display	E464/E465 (INVERTER1 PCB) E364/E365 (INVERTER2 PCB)
Judgment Method	· Will occur if the overcurrent flowing in the IPM. · Detected by H/W or S/W
Cause of problem	· Installation defective · Comp. defective · PCB defective · Connection wire error · Motor defective

1. Cause of problem

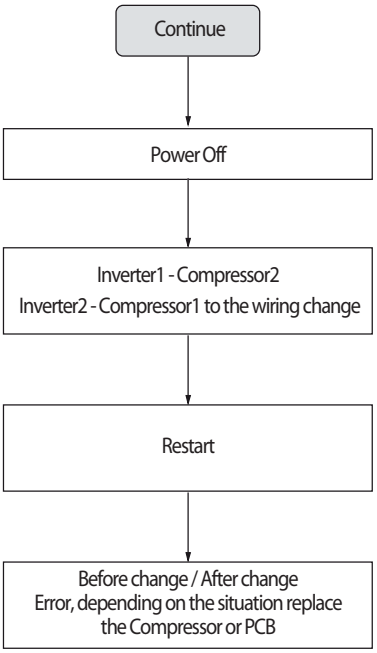

Power Off
Is the outdoor unit installed properly?
No
Remove the obstacles and check the status of the installation.
Yes
Is temperature sensor location and the measurement value normally?
No
Power Off, and then replacement or correction of the sensor location
Yes
Is the resistance value between phase of Compressor wire (U-V, V-W, W-U) less than 2Ω?
No
Replace Compressor
Yes
Is the resistance between the body of Compressor and chassis MΩ?
No
Replace Compressor
Yes
Does the Compressor connection wire properly connect to the compressor?
No
Check the connection wire (Check the status of the connection UVW)
Yes
Continue

Inverter Overcurrent error (cont.)

■ **Compressor applied one**



■ **Compressor applied two**



Before change	After change	Measure
Error of No.1 Compressor	Error of No.1 Compressor	Replace No.1 Compressor
Error of No.1 Compressor	Error of No.2 Compressor	Replace No.1 Inverter PCB
Error of No.2 Compressor	Error of No.2 Compressor	Replace No.2 Compressor
Error of No.2 Compressor	Error of No.1 Compressor	Replace No.2 Inverter PCB

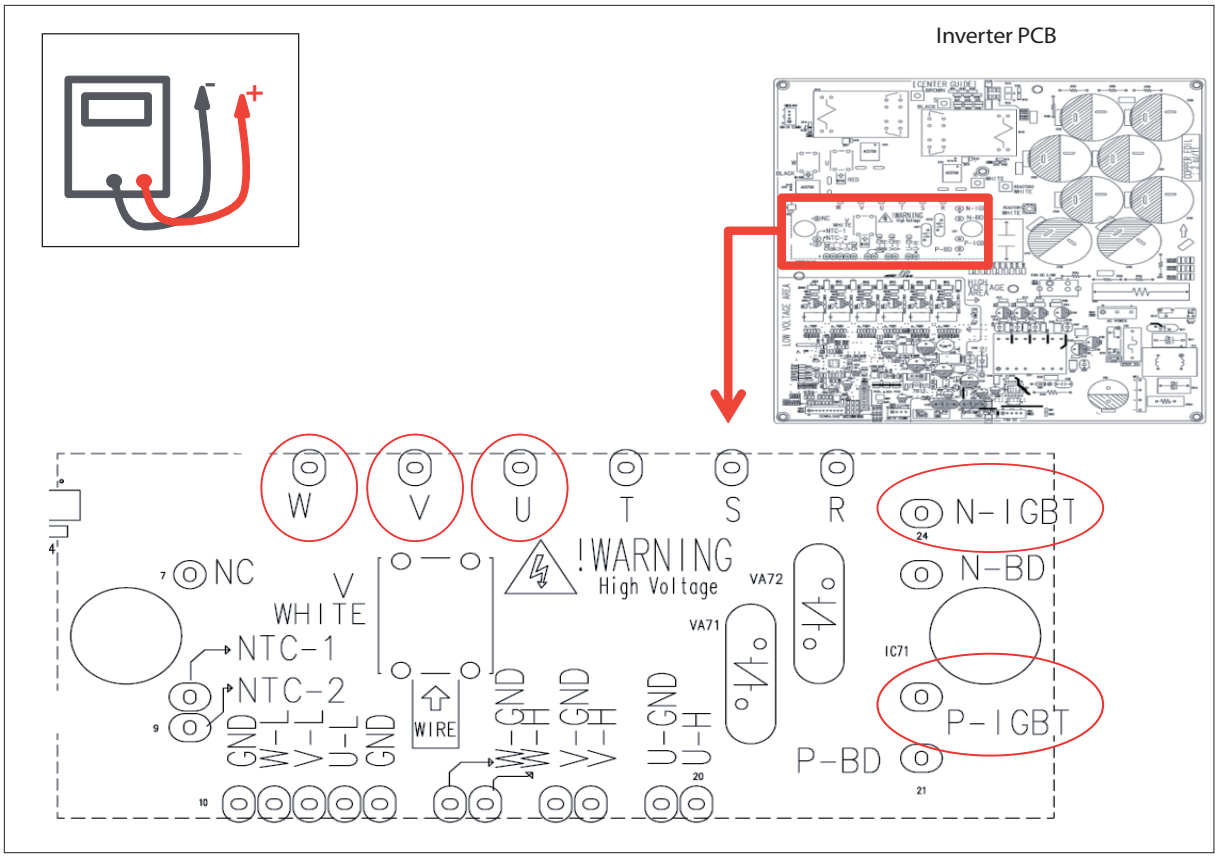
IPM [IGBT] breakdown diagnostics (Inverter PCB)

1. Preparations before checking
   1) Power Off.
   2) IPM failure, discharge mode may not work properly. Therefore, wait more than 15 minutes after the Power Off.
   3) Remove all of the Inverter PCB connectors and wire that is fixed as screw.
      (Include wire that is fixed to compressor and DC Reactor.)
   4) Prepare the digital multi tester.

2. Inspection Method
   1) Refer to Figure1 and Table1, respectively the resistance value and diode voltage value measure.
   2) According to the criterion in Table 1 to determine whether the failure of IPM.

Division	Measured Point		Criterion	Remark
	+	-		
Measure the resistance values	P-IGBT	U	More than 3 MΩ	Measurement error can occur for reasons s uch as the initial measurement condenser discharge. Measured over at least three times.
	P-IGBT	V		
	P-IGBT	W		
	U	N-IGBT		
	V	N-IGBT		
	W	N-IGBT		
Measure the diode voltage values	U	P-IGBT	0.3~0.7V	
	V	P-IGBT		
	W	P-IGBT		
	N-IGBT	U		
	N-IGBT	V		
	N-IGBT	W		

< Table 1 >

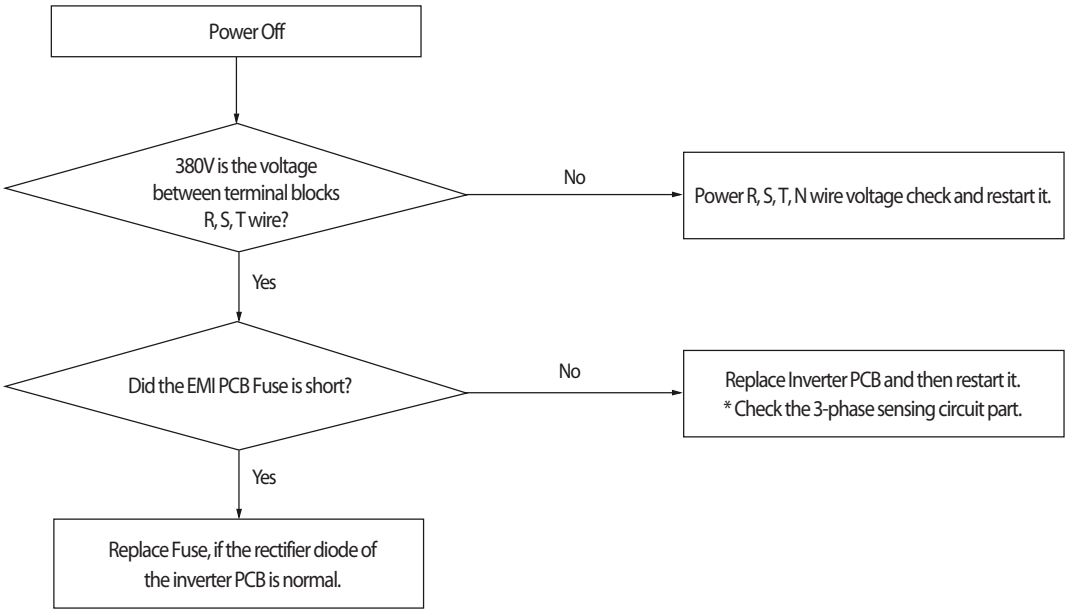


< Figure 1 >

4-3-48 Overvoltage / Low voltage error

Outdoor unit display	E466 (INVERTER1 PCB) E366 (INVERTER2 PCB)
Judgment Method	· N-phase wiring error and EMI Fuse short. · DC-Link Overvoltage / Low voltage occurs.
Cause of problem	· Check the input wiring · EMI Fuse short

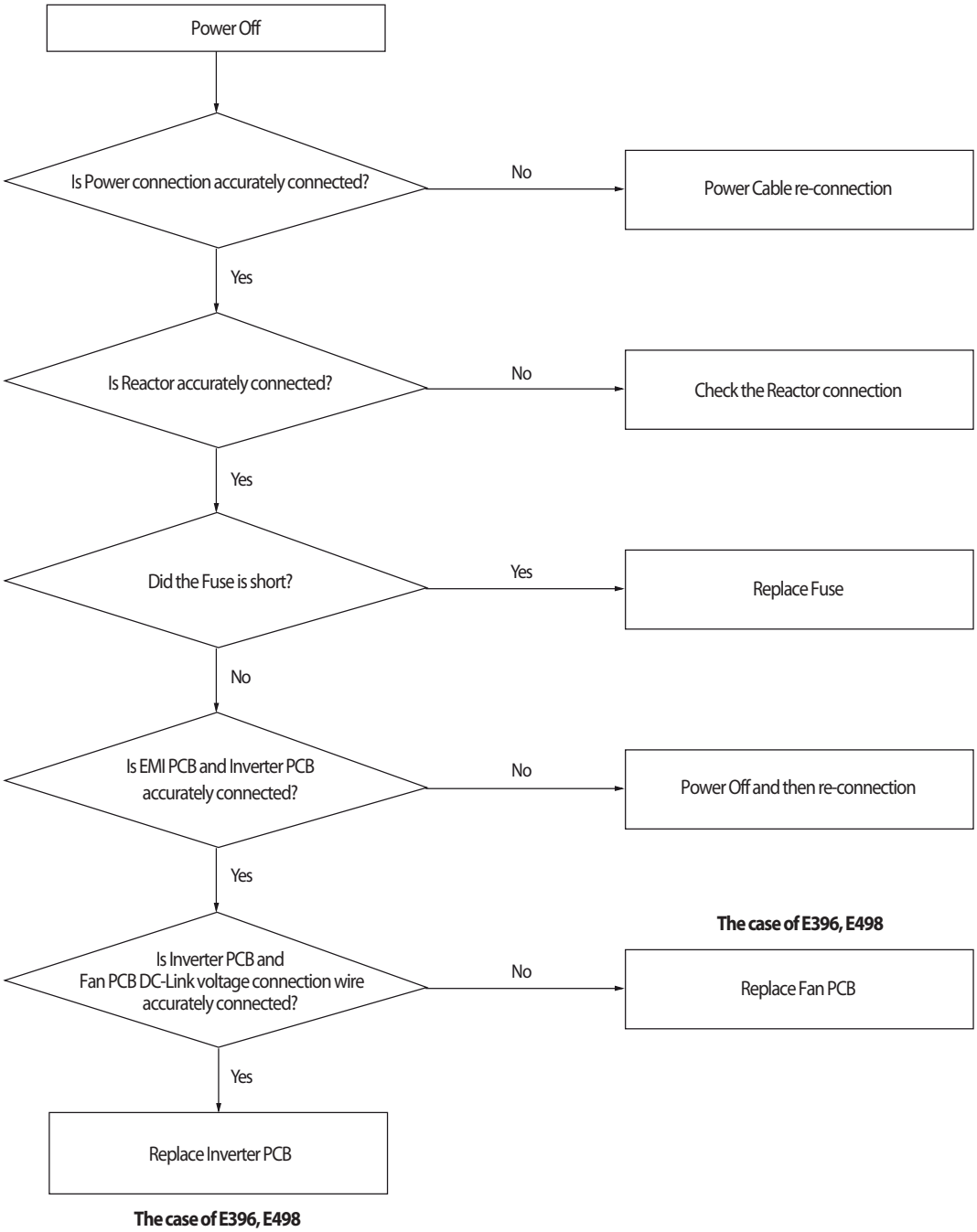
1. Cause of problem


Power Off
380V is the voltage between terminal blocks R, S, T wire?
No
Power R, S, T, N wire voltage check and restart it.
Yes
Did the EMI PCB Fuse is short?
No
Replace Inverter PCB and then restart it.
* Check the 3-phase sensing circuit part.
Yes
Replace Fuse, if the rectifier diode of the inverter PCB is normal.

4-3-49 DC Link voltage sensor error

Outdoor unit display	E469 (INVERTER1 PCB) E369 (INVERTER2 PCB) E496 (OUTDOOR FAN 1 PCB) E396 (OUTDOOR FAN 2 PCB)
Judgment Method	· DC voltage detection : Judged as an error if the detected value is more than 2.8V or 0.2V less than
Cause of problem	· Input voltage defective · AC Power wiring error · Momentary Overvoltage / Low voltage occurs · PCB voltage sensing circuit defective

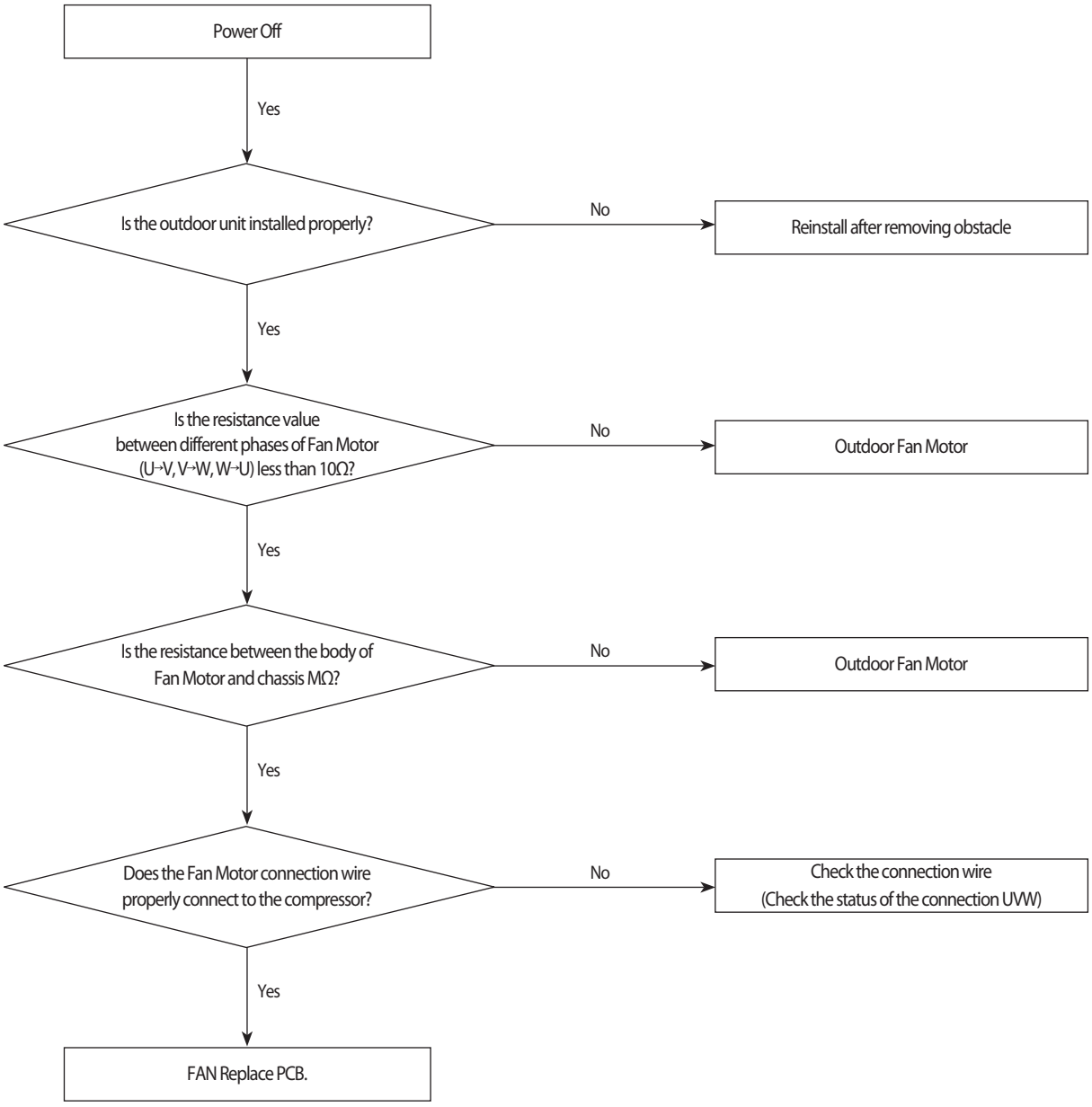
1. Cause of problem



4-3-50 Fan Motor Overcurrent error

Outdoor unit display	E478/E489 (FAN PCB(FAN1)) E378/E389 (FAN PCB(FAN2))
Judgment Method	· Occurs when overcurrent flows in the IPM. · Detected by H/W or S/W
Cause of problem	· Installation error · Defective Comp · Defective PCB · Connector error · Defective Motor

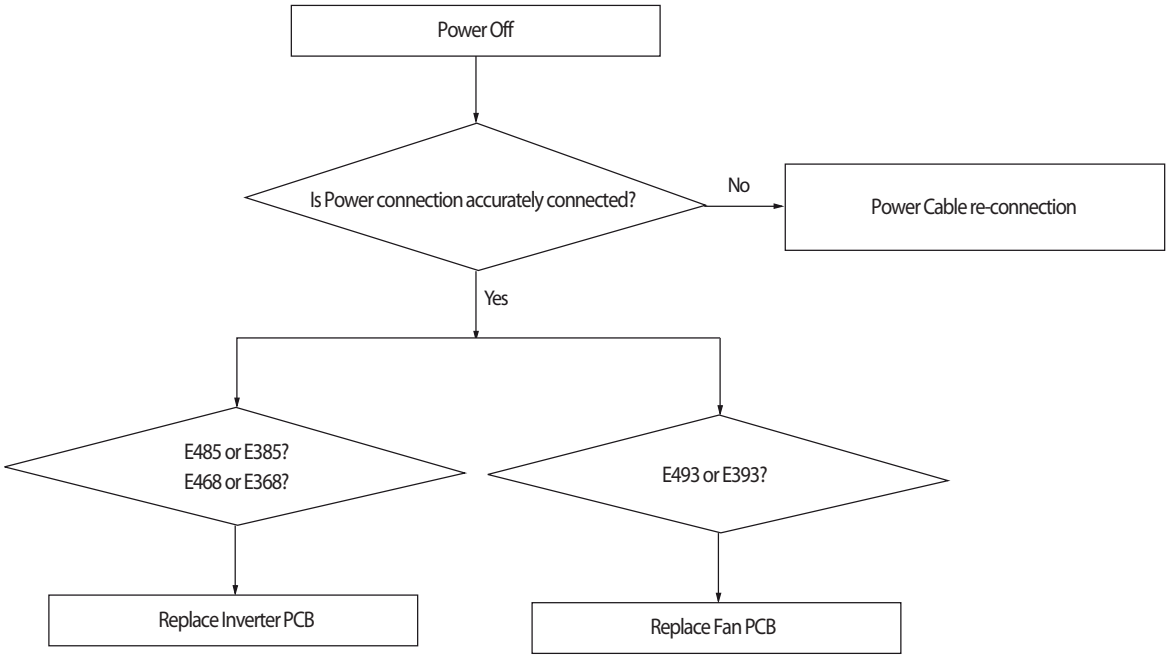
1. Cause of problem


Power Off
Yes
Is the outdoor unit installed properly?
No
Reinstall after removing obstacle
Yes
Is the resistance value between different phases of Fan Motor (U→V, V→W, W→U) less than 10Ω?
No
Outdoor Fan Motor
Yes
Is the resistance between the body of Fan Motor and chassis MΩ?
No
Outdoor Fan Motor
Yes
Does the Fan Motor connection wire properly connect to the compressor?
No
Check the connection wire (Check the status of the connection UVW)
Yes
FAN Replace PCB.

4-3-51 Input / Output Current sensor error

Outdoor unit display	E485 INVERTER1 PCB(Input Current sensor) E385 INVERTER2 PCB(Input Current sensor) E468 INVERTER1 PCB(Output Current sensor) E368 INVERTER 2 PCB(Output Current sensor) E493 OUTDOOR FAN PCB (FAN1 Output Current sensor) E393 OUTDOOR FAN PCB (FAN2 Output Current sensor)
Judgment Method	· Sensor Output detection : Judged as an error if the detected value is more than 2.8V or 0.2V less than
Cause of problem	· Input voltage defective · PCB voltage sensing circuit defective

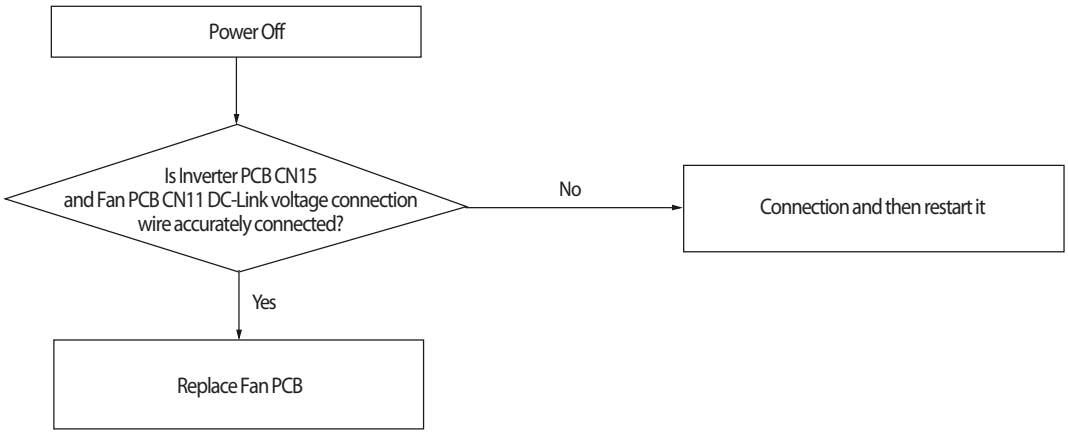
1. Cause of problem



4-3-52 Outdoor Fan PCB Overvoltage / Low voltage error

Outdoor unit display	E486
Judgment Method	· N-phase wiring error and EMI Fuse short. · DC-Link Overvoltage / Low voltage occurs.
Cause of problem	· Check the input wiring · EMI Fuse short

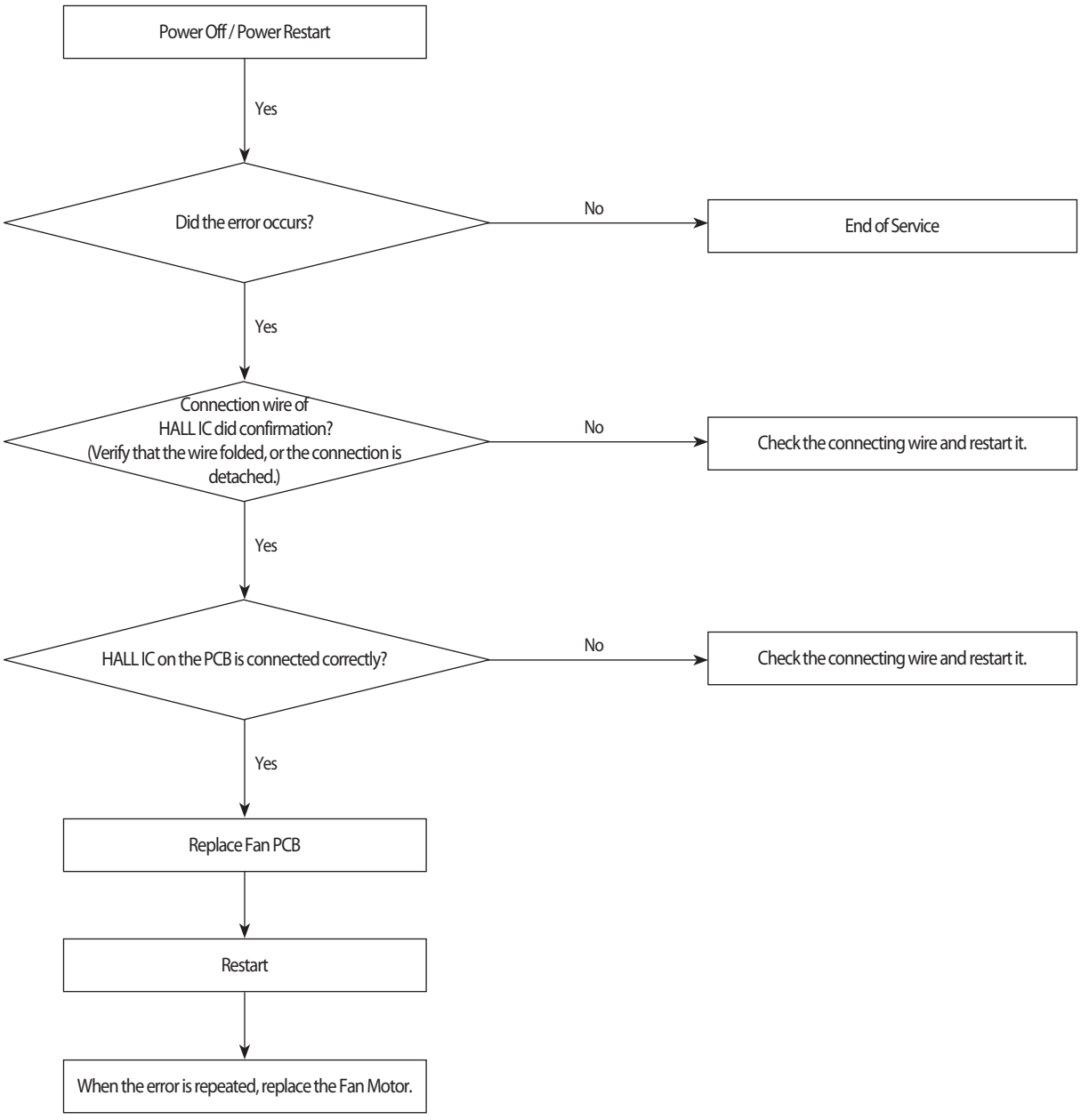
1. Cause of problem



4-3-53 Hall IC(Fan) error

Outdoor unit display	E487 (FAN PCB(FAN1)) E387 (FAN PCB(FAN2))
Judgment Method	· Fan rotation defective or vibration and noise of the defective operation. · Hall IC there is no signal input.
Cause of problem	· Connection status error. · Hall IC wire disconnection. · Defective circuit parts and defective manufacturing. · Fan Motor defective.

1. Cause of problem


Power Off / Power Restart
Yes
Did the error occurs?
No
End of Service
Yes
Connection wire of HALL IC did confirmation? (Verify that the wire folded, or the connection is detached.)
No
Check the connecting wire and restart it.
Yes
HALL IC on the PCB is connected correctly?
No
Check the connecting wire and restart it.
Yes
Replace Fan PCB
Restart
When the error is repeated, replace the Fan Motor.

4-3-54 Inverter Overheat error

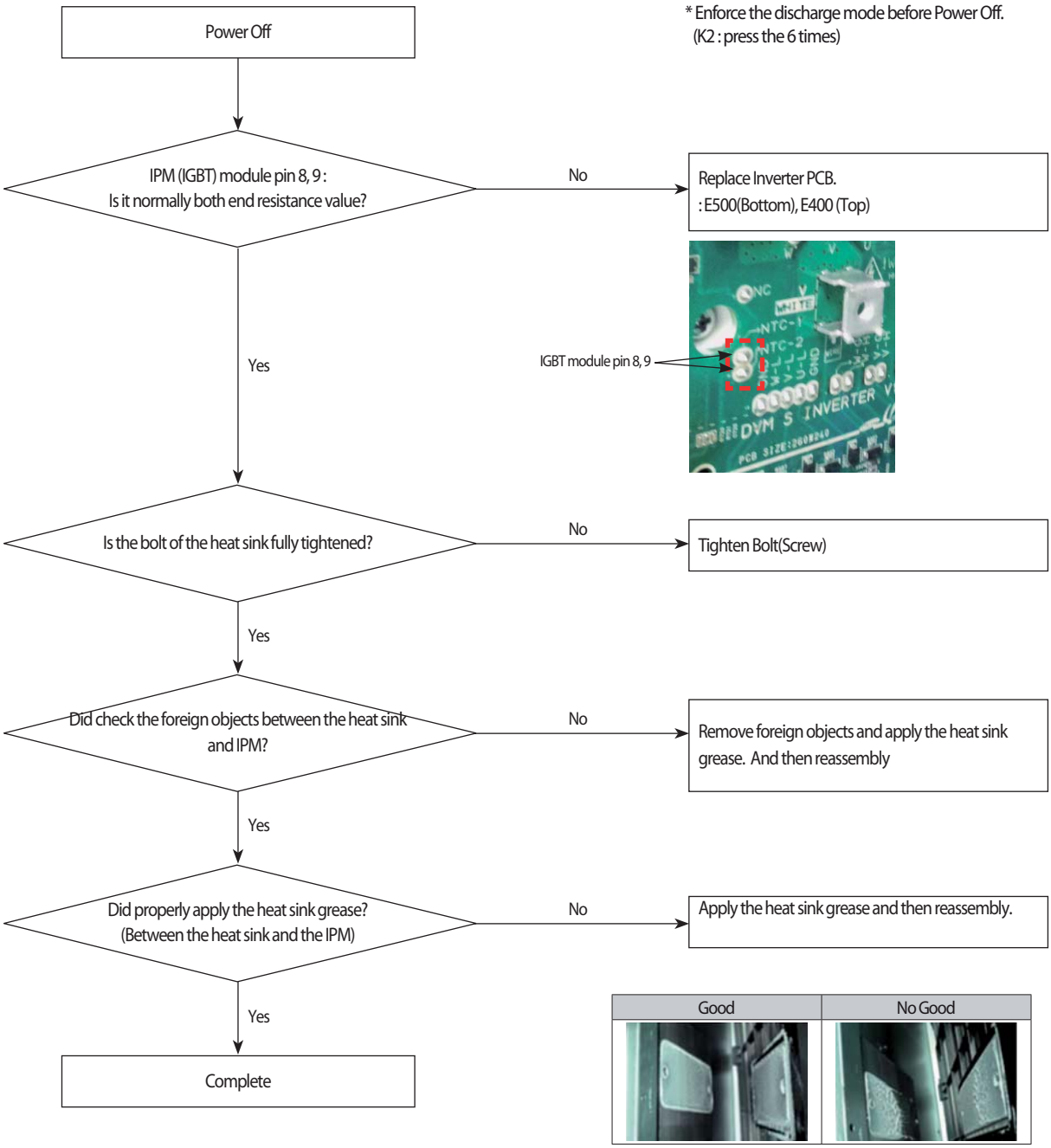
Outdoor unit display	E500 (INVERTER1 PCB) E400 (INVERTER2 PCB)
Judgment Method	· IGBT module internal temperature : 105℃ more than (E500, E400)
Cause of problem	· Cooling Pin and the IGBT junction part assembly defective. · Refrigerant cooling heat sink and refrigerant piping assembly defective. · Assembled bolt defective.

Both end resistance values of IGBT module pin(8, 9 pin)

Temperature [℃]	NTC [ohm]	AD [V]
10	9000	2.58
20	6000	2.33
30	4000	2.03
40	3000	1.80
50	2000	1.47
60	1600	1.29
70	1200	1.07
80	750	0.76
90	650	0.68

Temperature [℃]	NTC [ohm]	AD [V]
100	500	0.55
105	450	0.51
110	380	0.44
120	300	0.35
130	250	0.30
140	200	0.25

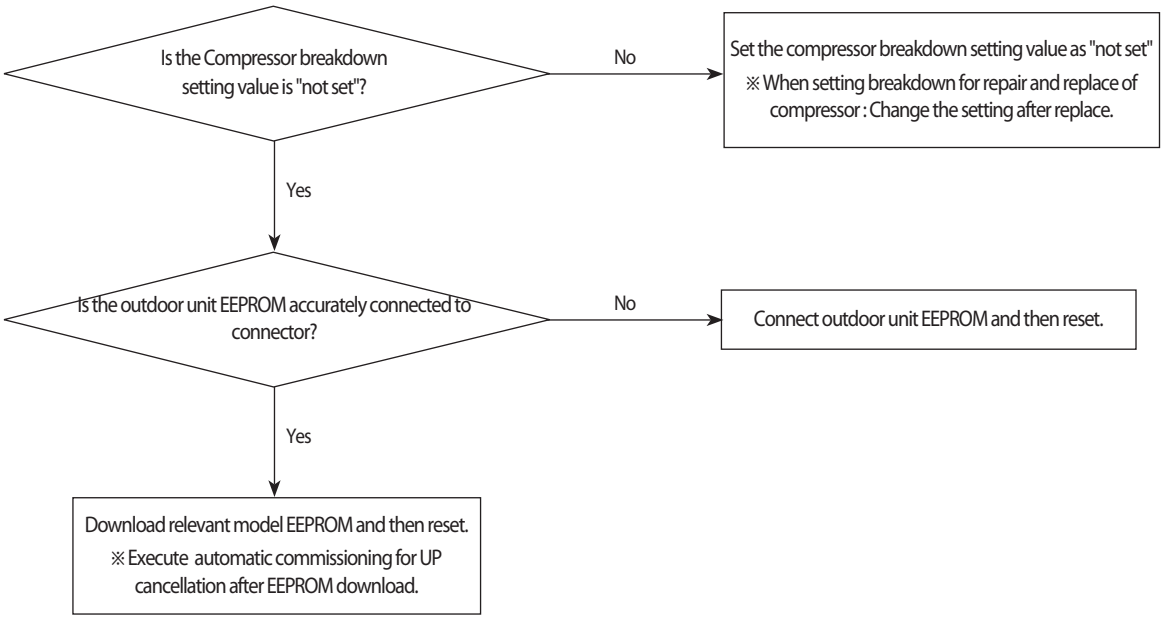
1. Cause of problem


Power Off
* Enforce the discharge mode before Power Off.
(K2 : press the 6 times)
IPM (IGBT) module pin 8, 9 :
Is it normally both end resistance value?
No
Replace Inverter PCB.
: E500(Bottom), E400 (Top)
Yes
IGBT module pin 8, 9
Is the bolt of the heat sink fully tightened?
No
Tighten Bolt(Screw)
Yes
Did check the foreign objects between the heat sink and IPM?
No
Remove foreign objects and apply the heat sink grease. And then reassembly
Yes
Did properly apply the heat sink grease?
(Between the heat sink and the IPM)
No
Apply the heat sink grease and then reassembly.
Yes
Complete
Good
No Good

4-3-55 Option setting error of outdoor unit

Outdoor Unit Display	E560
Indoor Unit Display	◑(Operation) ×(Reservation) ◑(Blast) ×(Filter) ×(Defrost)
Judgment Method	• Refer to the judgment method below.
Special Cause	• Option setting error of outdoor unit (E2P option use of other model or set of the relevant outdoor unit, compressor breakdown)

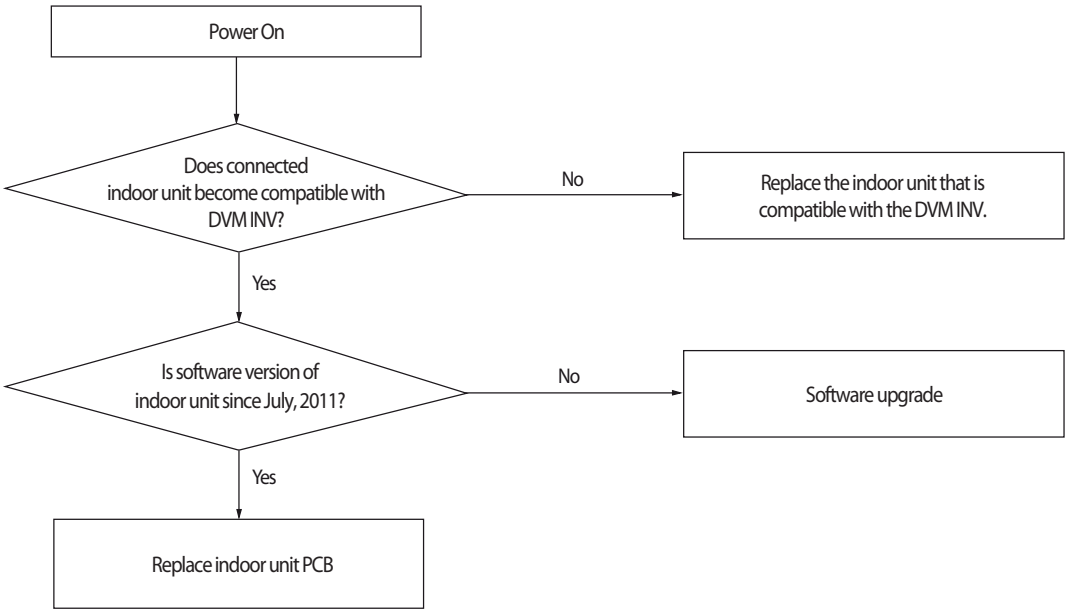
1. Cause of problem


Is the Compressor breakdown setting value is "not set"?
No
Set the compressor breakdown setting value as "not set"
※ When setting breakdown for repair and replace of compressor : Change the setting after replace.
Yes
Is the outdoor unit EEPROM accurately connected to connector?
No
Connect outdoor unit EEPROM and then reset.
Yes
Download relevant model EEPROM and then reset.
※ Execute automatic commissioning for UP cancellation after EEPROM download.

4-3-56 Model mismatching of Indoor unit.

Outdoor unit display	E563
Judgment Method	· Prior to July 2011, if the software version of the indoor unit. · Prior to July 2011, if the software version of the indoor unit.
Cause of problem	· Check the software version of the indoor unit. · Check whether the support of the indoor unit.

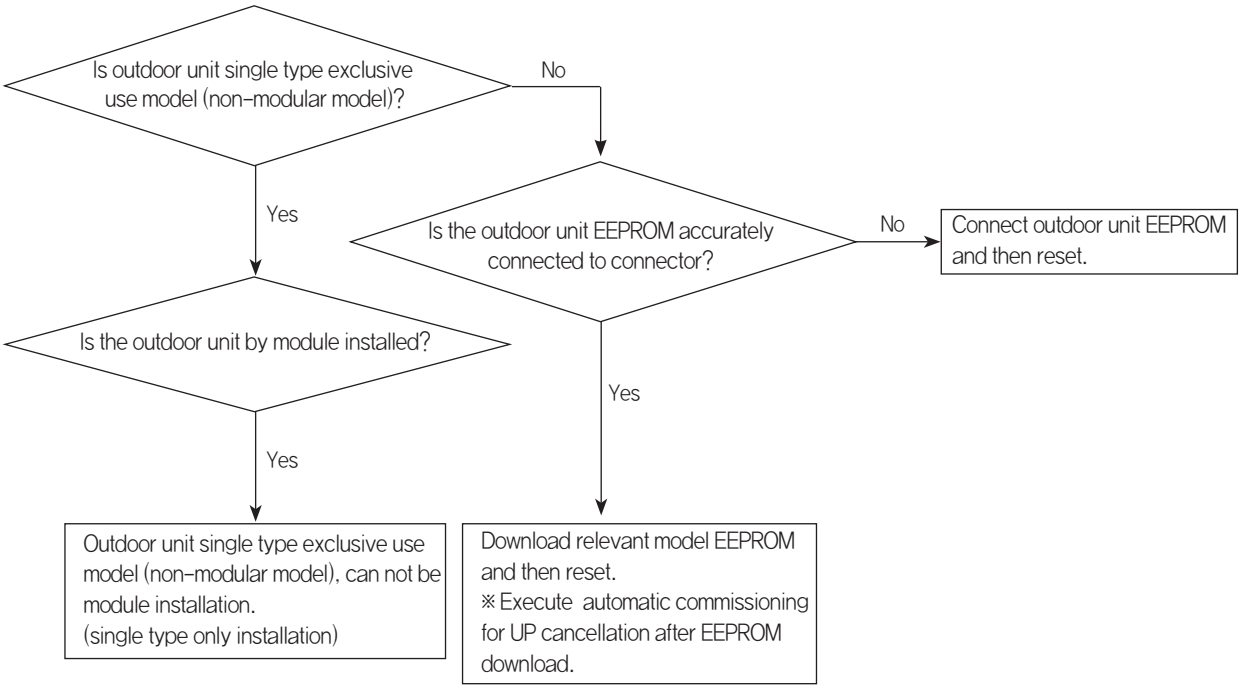
1. Cause of problem


Power On
Does connected indoor unit become compatible with DVM INV?
No
Replace the indoor unit that is compatible with the DVM INV.
Yes
Is software version of indoor unit since July, 2011?
No
Software upgrade
Yes
Replace indoor unit PCB

4-3-57 Error due to using single type outdoor unit in a module installation

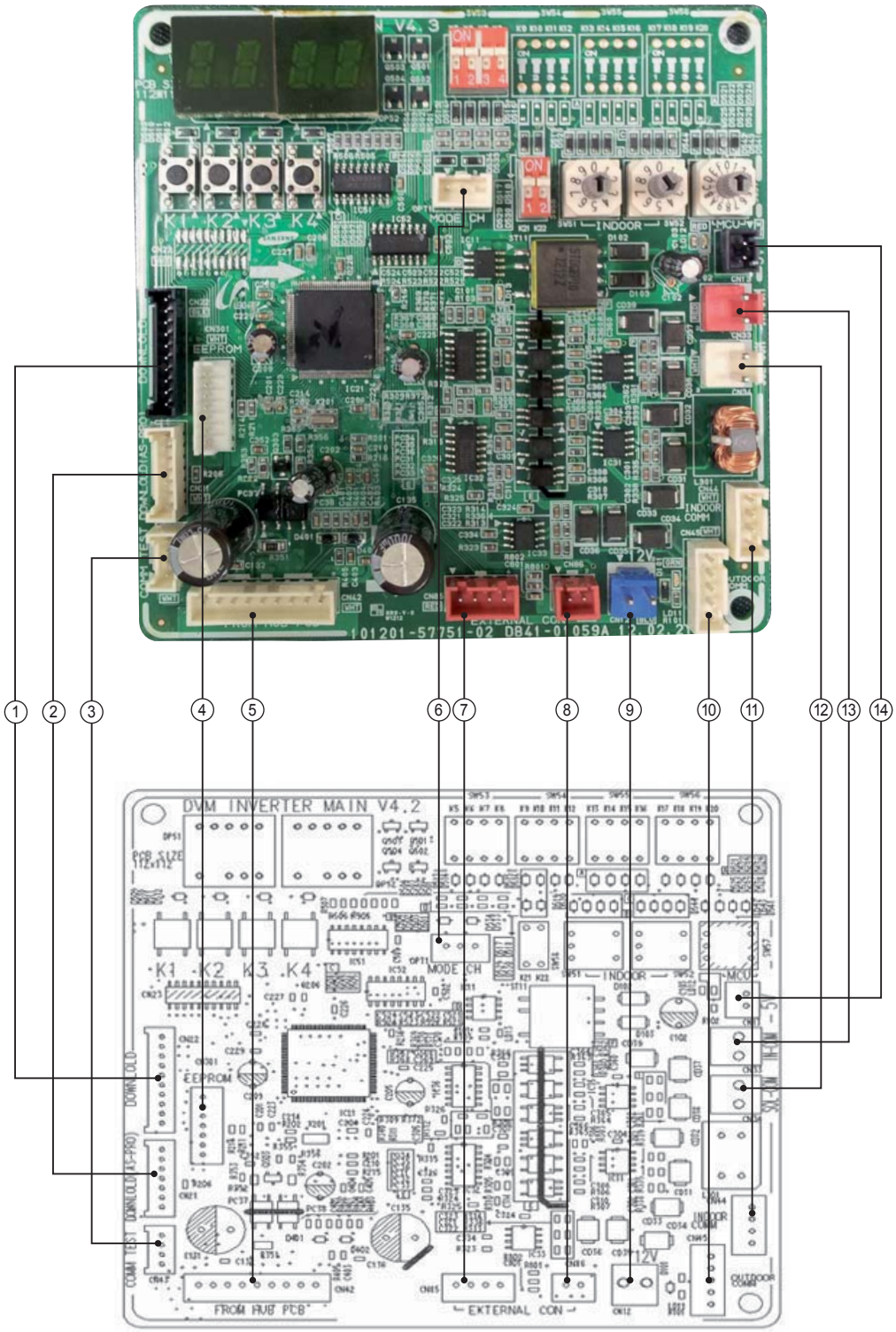
Outdoor Unit Display	E573
Indoor Unit Display	-
Judgment Method	• Refer to the judgment method below.
Special Cause	• Using single type outdoor unit (non-modular model) in a module installation.

1. Cause of problem


Is outdoor unit single type exclusive use model (non-modular model)?
No
Yes
Is the outdoor unit EEPROM accurately connected to connector?
No
Connect outdoor unit EEPROM and then reset.
Is the outdoor unit by module installed?
Yes
Yes
Outdoor unit single type exclusive use model (non-modular model), can not be module installation.
(single type only installation)
Download relevant model EEPROM and then reset.
※ Execute automatic commissioning for UP cancellation after EEPROM download.

5. PCB Diagram and Parts List

5-1 ASS'Y PCB MAIN

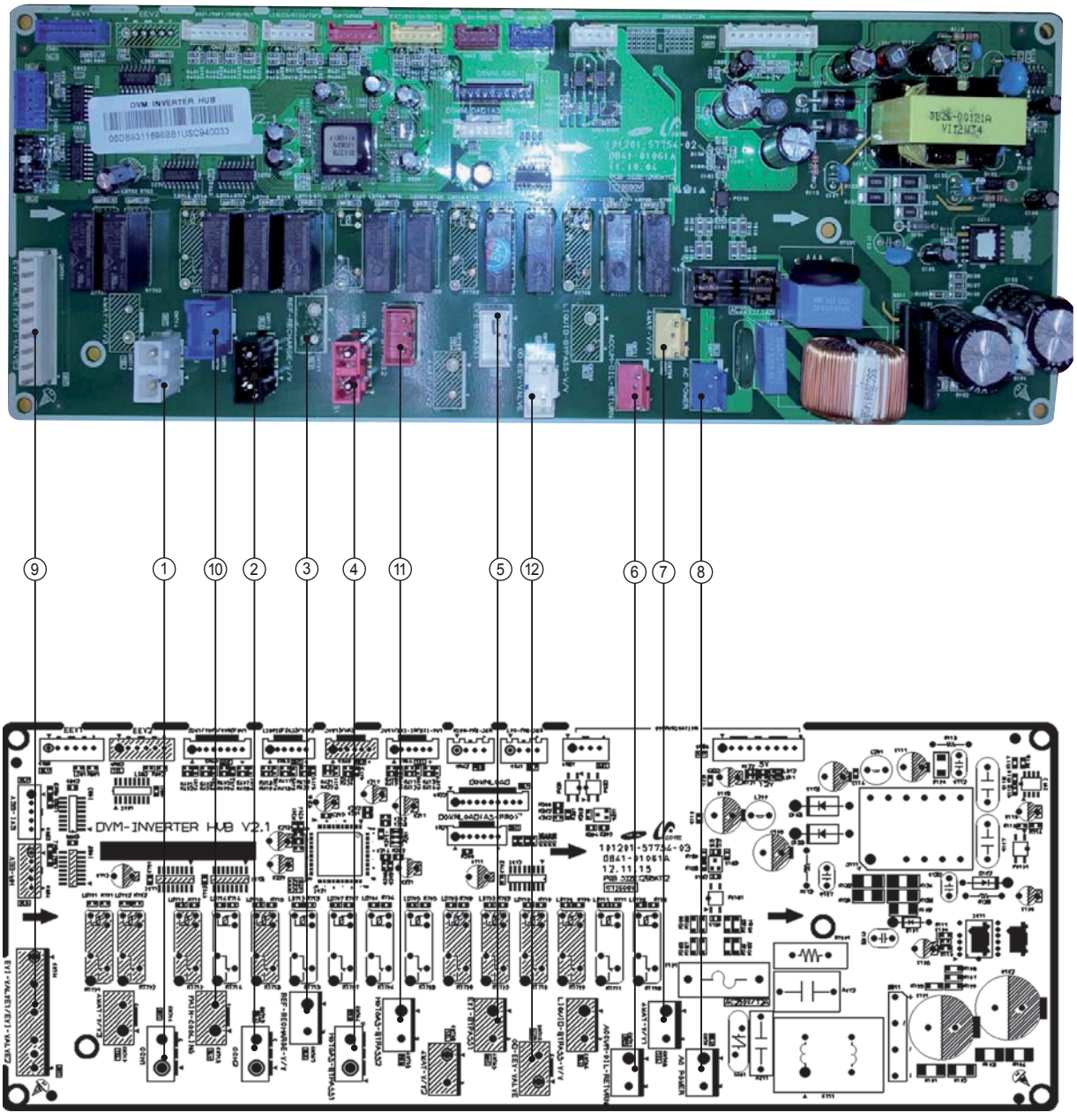


ASS'Y PCB MAIN (cont.)

① CN22-PC DOWN LOADER PART #1 : RX-DOWN #2 : TX-DOWN #3 : N-TRST #4 : TDO #5 : TCK #6 : TDI #7 : TMS #8 : • #9 : GND #10 : VCC	② CN21-ASPRO DOWN LOADER PART #1 : VCC #2 : MODE0 #3 : RESET_MAIN #4 : #5 : F_SCLK #6 : F_SDAT #7 : GND	③ CN43-COMM TEST #1 : 12V #2 : INVERTER-INRUSH-OUT #3 : INVERTER-COMM #4 : GND	④ CN301-EEPROM #1 : GND #2 : #3 : VCC #4 : EEPROM-SELECT #5 : EEPROM-SO #6 : EEPROM-SI #7 : EEPROM-CLOCK
⑤ CN42 - HUB COMMUNICATION #1 : 12V #2 : INVERTER-INRUSH-OUT #3 : INVERTER-COMM #4 : GND #5 : HIGH-PRESSURE-SENSOR #6 : LOW-PRESSURE-SENSOR #7 : ZERO-CROSSING #8 : GND #9 : VCC	⑥ OPTI -MODE SELECTOR #1 : KEY3 #2 : GRID #3 : KEY4	⑦ CN85-STATE CHECK #1 : 12V #2 : ERROR-CHECK-OUT #3 : 12V #4 : COMP-CHECK-OUT	⑧ CN86-OUTSIDE CONTROLLER #1 : CONTROL #2 : GND
⑨ CN12 - TRANSMITTER DC POWER 12V #1 : 12V #2 : GND	⑩ CN45 -OUTDOOR UNIT COMM. #1 : COM-C #2 : COM-D #3 : #4 : 12V #5 : GND	⑪ CN44 - INDOOR UNIT COMM. #1 : COM-A #2 : COM-B #3 : 5V #4 : AGND	⑫ CN34-NONUSE COMM. #1 : COM-E #2 : COM-F
⑬ CN33-INDOOR UNIT COMM. (REDUNDANCY) #1 : COM-A #2 : COM-B	⑭ CN13-POWER 5V #1 : COM-A #2 : COM-B		

5-2 ASS'Y PCB MAIN-HUB

■ AC



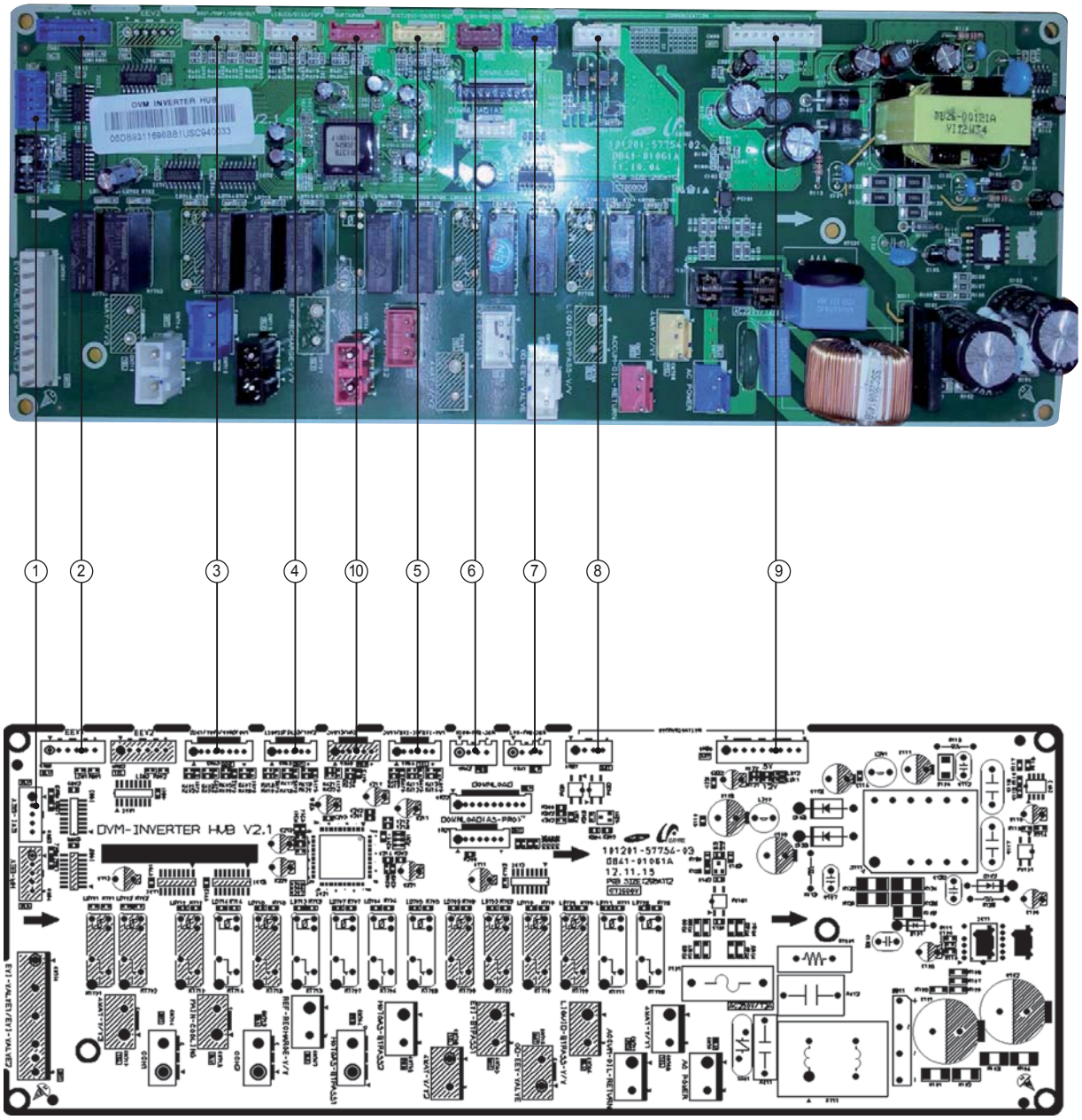
ASS'Y PCB MAIN-HUB (cont.)

■ AC (cont.)

① CN714-CCH1 #1 : N #2 : CCH1	② CN713-CCH2 #1 : N #2 : CCH2	③ CN707-REF-RECHARGE #1 : REF-RECHARGE V/V #2 : N	④ CN704-HOTGASVALVE1 #1 : N #2 : HOTGAS BYPASS1
⑤ CN705-HOTGASVALVE2 #1 : HOTGAS BYPASS2 #2 : N	⑥ CN711-OIL RETURN VALVE #1 : ACCUM OIL RETURN VALVE #2 : N	⑦ CN708- 4-WAY VALVE #1 : 4-WAY VALVE #2 : N	⑧ CN70-AC #1 : AC #2 : AC
⑨ CN701 #1: EVI V/V 1 # 3: EVI V/V 2	⑩ CN715-MAIN-COOLING #1: AC # 2: AC	⑪ CN705-HOTGAS-BYPASS2 #1: AC # 2: AC	⑫ CN716-OD-EEV-VALVE #1: AC # 2: AC

ASS'Y PCB MAIN-HUB (cont.)

■ DC

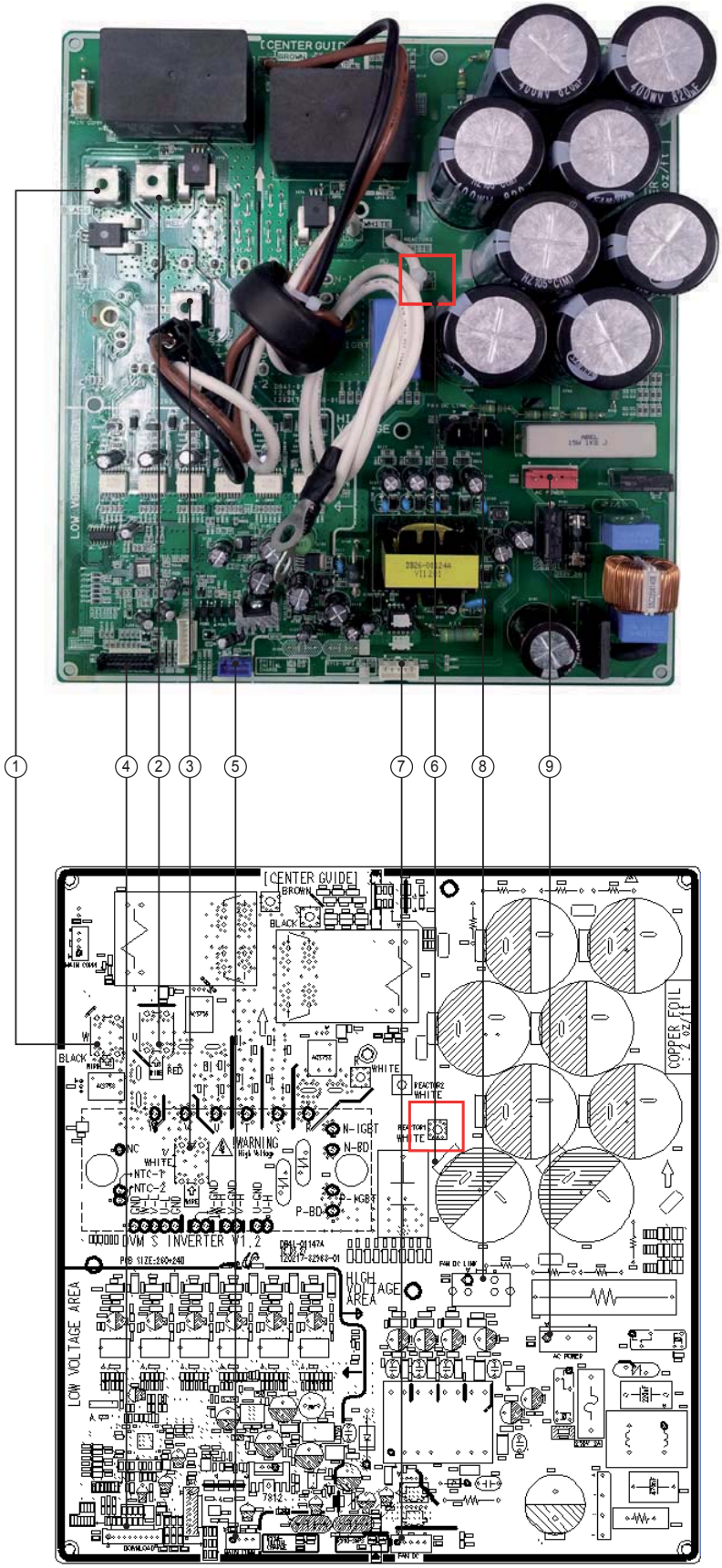


ASS'Y PCB MAIN-HUB (cont.)

■ DC (cont.)

① CN83-EVI EEV #1 : RX-DOWN #2 : TX-DOWN #3 : N-TRST #4 : TDO #5 : TCK #6 : TDI #7 : TMS #8 : #9 : GND #10 : VCC	② CN81-EEV1 #1 : VCC #2 : MODE0 #3 : RESET_MAIN #4 : • #5 : F_SCLK #6 : F_SDAT #7 : GND	③ CN43-TEMP. SENSOR #1 : COMP1 DISACHRGE #2 : COMP1 DISCHARGE #3 : COMP1 TOP #4 : COMP1 TOP #5 : COND OUT #6 : COND OUT #7 : OUTDOOR TEMP. #8 : OUTDOOR TEMP.	④ CN45-TEMP. SENSOR #1 : LIQUID #2 : LIQUID #3 : COMP2 DISCHARGE #4 : COMP2 DISCHARGE #5 : COMP2 TOP #6 : COMP2 TOP
⑤ CN44 – TEMP. SENSOR #1 : SUCCTION #2 : SUCTION #3 : EVI INLET #4 : ENI INLET #5 : ENI OUT #6 : EVI OUT	⑥ CN42I –HIGH PRESSURE SENSOR #1 : HIGH PRESSURE SENSOR #3 : GND #4 : VCC	⑦ CN41 - LOW PRESSURE SENSOR #2 : LOW PRESSURE SENSOR #3 : GND #4 : VCC	⑧ CN97-TO FAN COMM. #1 : 12V #2 : INV-SMPS #3 : COMM-OUT #4 : GND
⑨ CN96 – MAIN –HUB COMM. #1 : CN12 #2 : INV_SMPS_RELAY #3 : GOMM-IN #4 : GND #5 : HIGH-PRESSURE-SENSOR #6 : LOW-PRESSURE-SENSOR #7 : ZERO-CROSSING #8 : GND #9 : VCC	⑩ CN46-SUCT #1 : SUCT2 #2 : SUCT2		

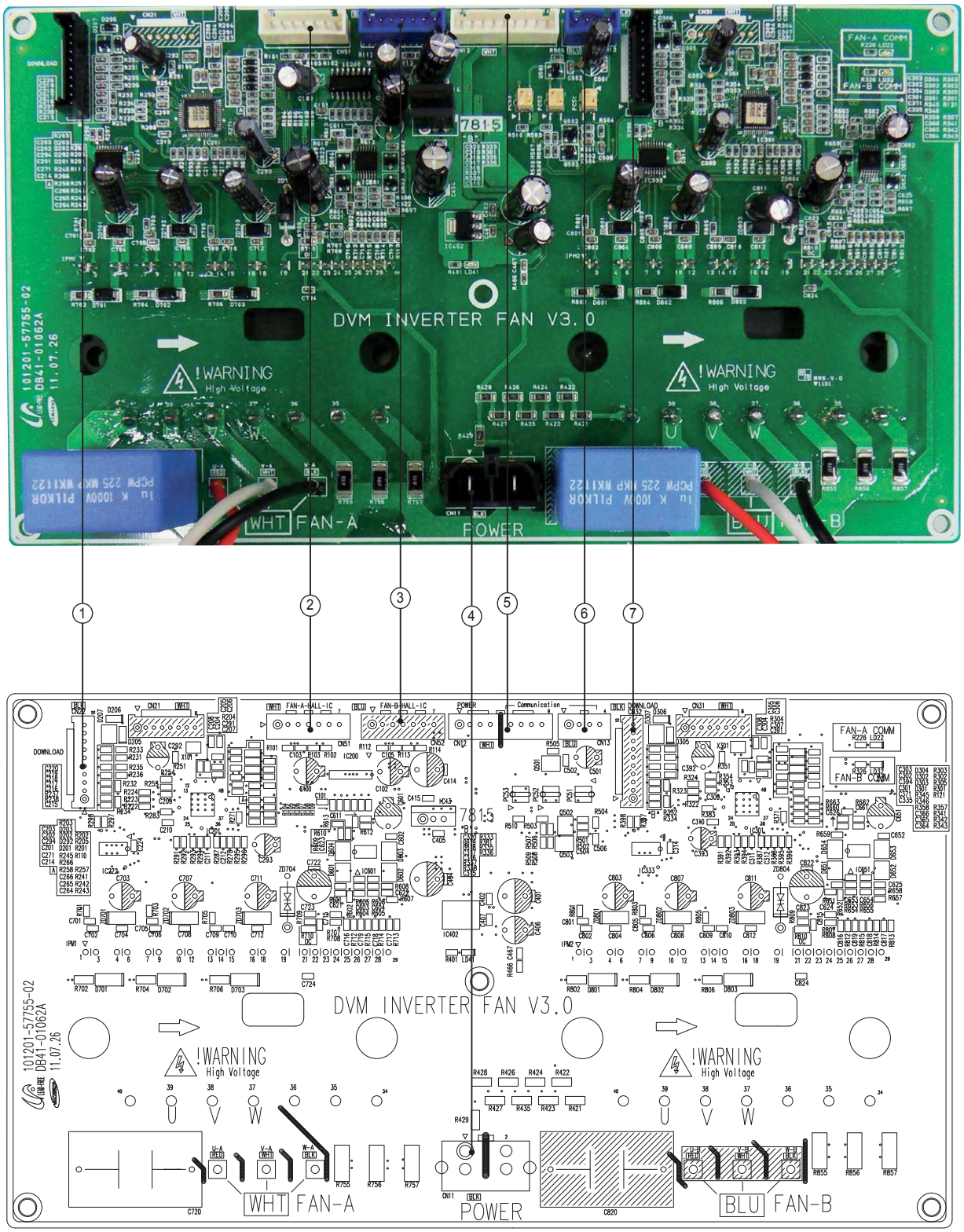
5-3 ASS'Y PCB INVERTER



ASS'Y PCB SUB-DRIVER (cont.)

① W- COMP W #1 : COMP W	② U-COMP U #1 : COMP U	③ V-COMP V #1 : COMP V	④ CN22-DOWNLOAD #1 : RX-DOWN #2 : TX-DOWN #3 : N-TRST #4 : TDO #5 : TCK #6 : TDI #7 : TMS #8 : #9 : GND #10 : VCC
⑤ CN32 – MAIN COMM #1 : 12V-MAIN #2 : IN-SMPS-RELAY #3 : COMM-IN #4 : GND-MAIN	⑥ REACTOR (WIRE CONNECTION) #1 : REACTOR #2 : REACTOR	⑦ CN91 - FAN DC #1 : 18V #2 : GND #3 : 5V-FAN #4 : AD-SELECT	⑧ CN15-FAN DC LINK #1 : 500V #2 : GND(500V)
⑨ CN13 - ACPOWER #1 : AC #2 : #3 : AC			

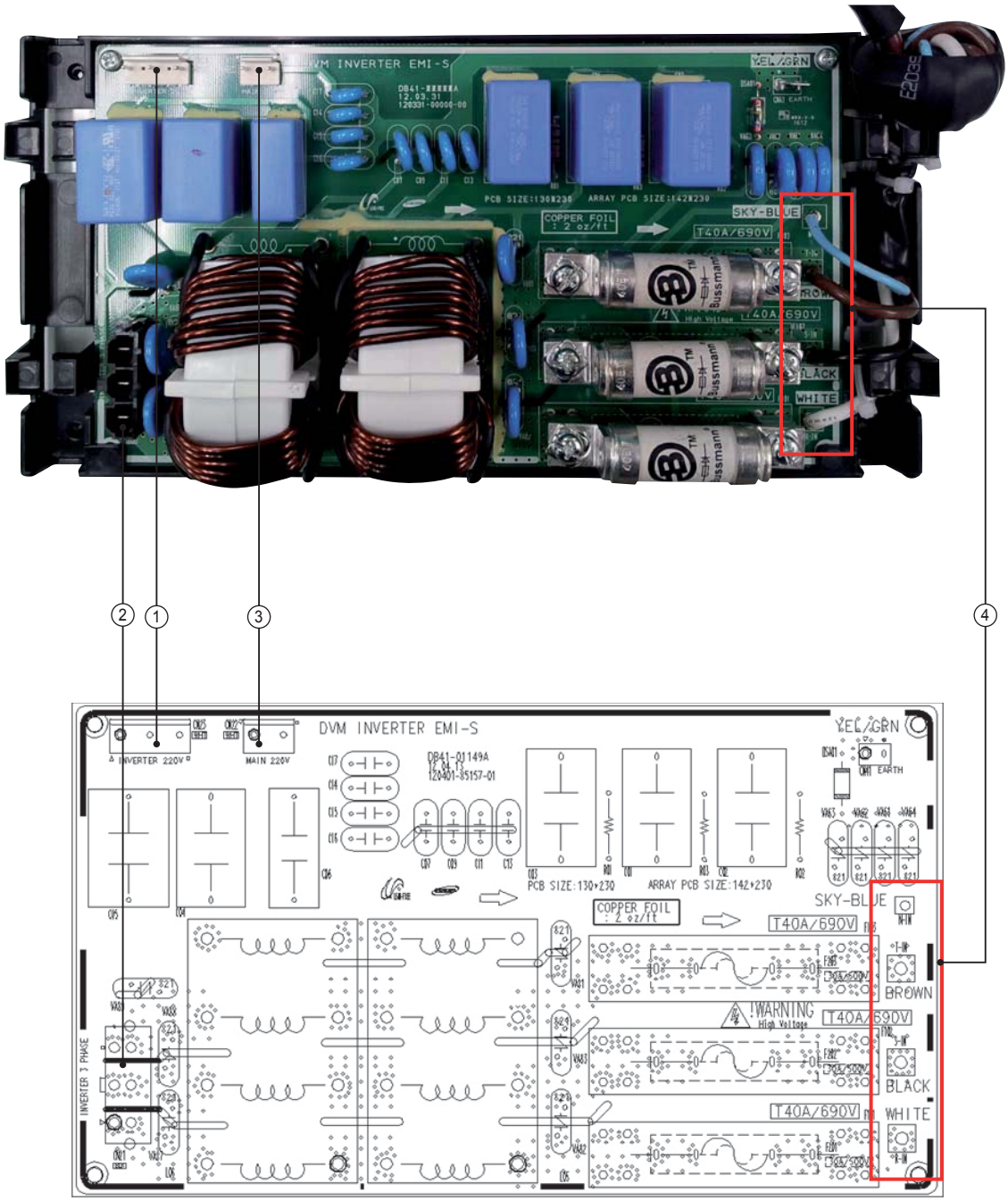
5-4 ASS'Y PCB FAN



ASS'Y PCB FAN (cont.)

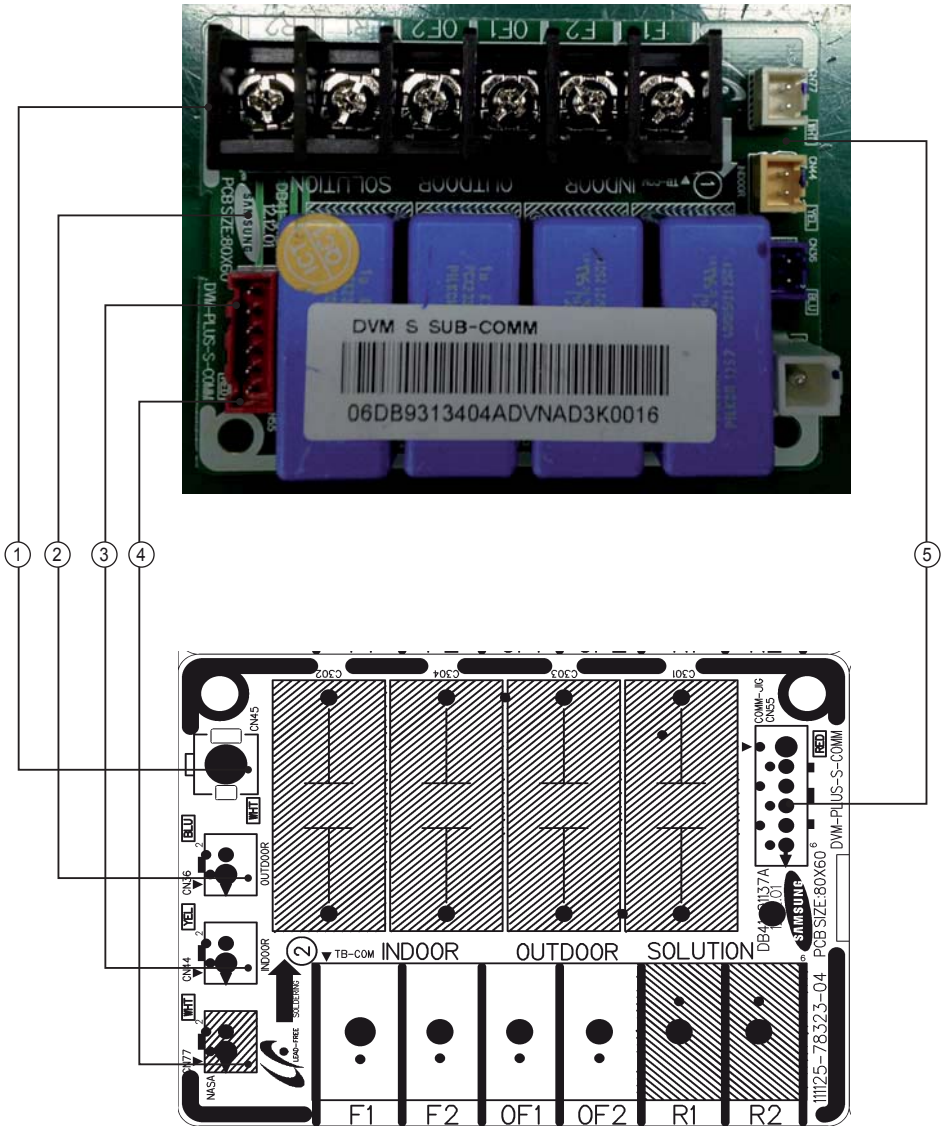
① CN22- DOWNLOAD1	② CN51-FANA-HALL	③ CN52-FANB_HALL	④ CN11 – POWER
#1 : RX-DOWN #2 : TX-DOWN #3 : N-TRST #4 : TDO #5 : TCK #6 : TDI #7 : TMS #8 : #9 : GND #10 : VCC	#1 : HALL-U #2 : 5V #3 : HALL-V #4 : GND #5 : HALL-W #6 : MT-TEMP #7 : GND	#1 : HALL-U #2 : 5V #3 : HALL-V #4 : GND #5 : HALL-W #6 : MT-TEMP #7 : GND	#1 : 500V #2 : GND(500V)
⑤ CN12-CONRTOL POWER	⑥ CN13- COMM	⑦ CN32-DOWNLOAD2	
#1 : 18V #2 : GND #3 : COMM-IN #4 : GND-MAIN #5 : #6 : 12-MAIN #7 : IN-SMPS-RELAY #8 : COMM-OUT #9 : GND-MAIN	#1 : 12-MAIN #2 : IN-SMPS-RELAY #3 : COMM-OUT #4 : GND-MAIN	#1 : RX-DOWN #2 : TX-DOWN #3 : N-TRST #4 : TDO #5 : TCK #6 : TDI #7 : TMS #8 : #9 : GND #10 : VCC	

5-5 ASS'Y PCB EMI



① CN23- INVERTER 220V	② CN21-FAN A	③ CN22-MAIN 220	④ RST- RST INPUT
#1 : AC #2 : #3 : AC	#1 : R #2 : S #3 : T	#1 : AC #2 : AC	T-IN S-IN R-IN

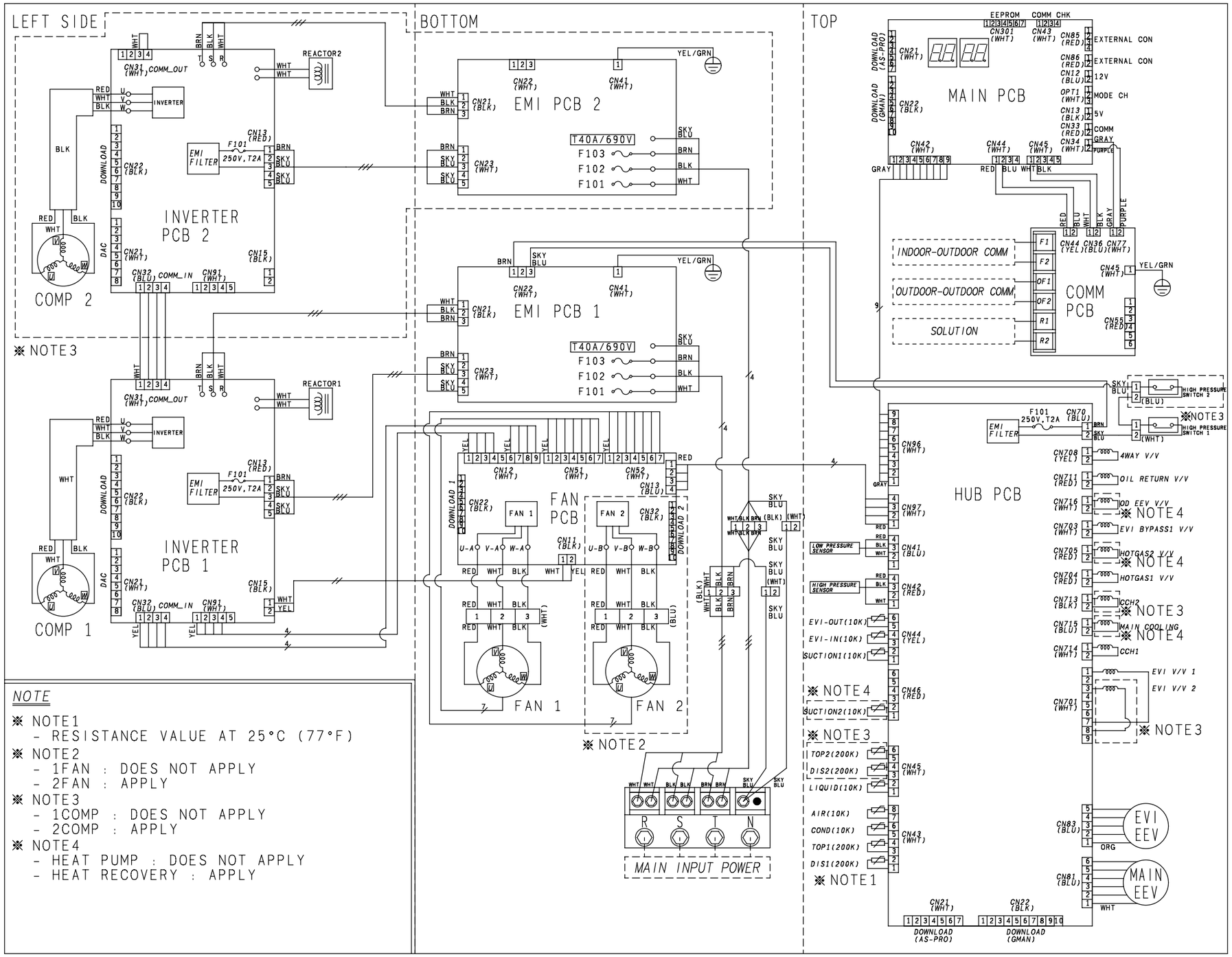
5-6 SUB-COMM



① CN44	② CN36	③ CN#44	④ CN45	⑤ CN55
#1 : F1 #2 : F2	#1 : OF1 #2 : OF2	#1 : R1 #2 : R2	GND	#1 :F1 #2 :F2 #3 :OF1 #4 :OF2 #5 :R1 #6 :R2

6. Wiring Diagram

6-1 AM080/100/120/140/160/180/200/220FXV✳✳✳



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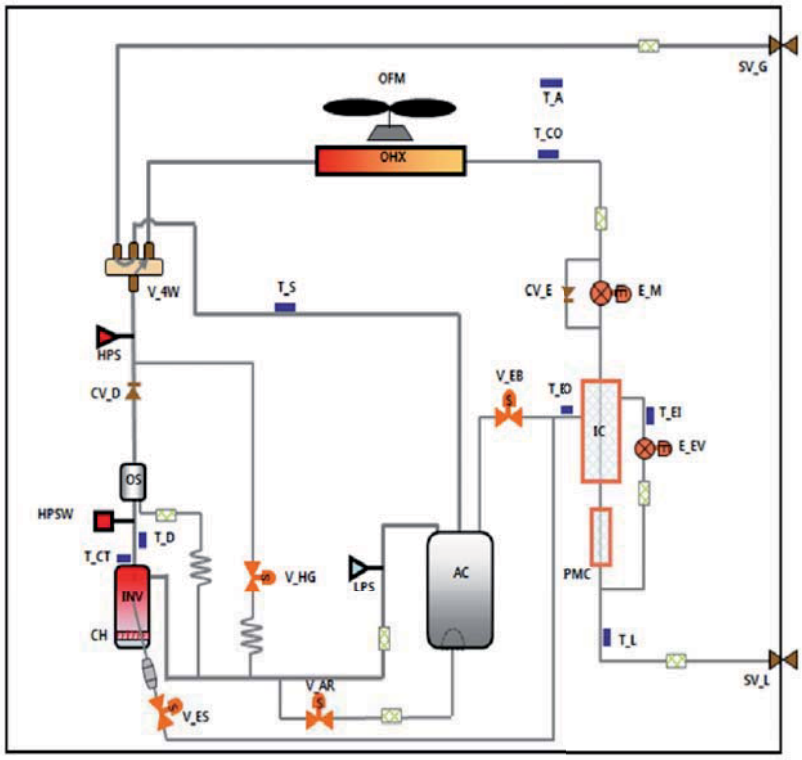
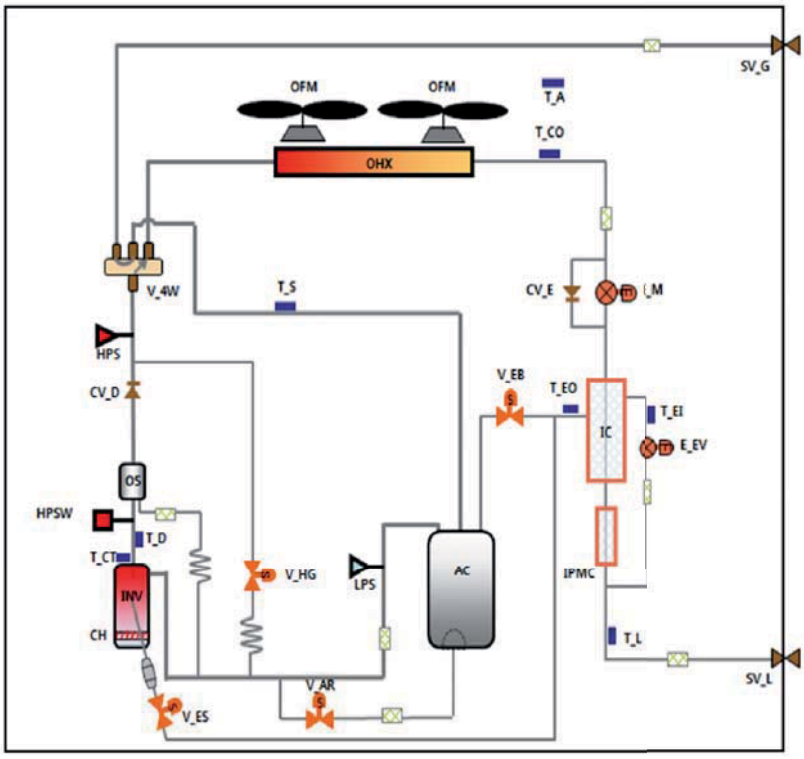
7. Cycle Diagram

7-1 AM080/100/120FXVAGH/EU



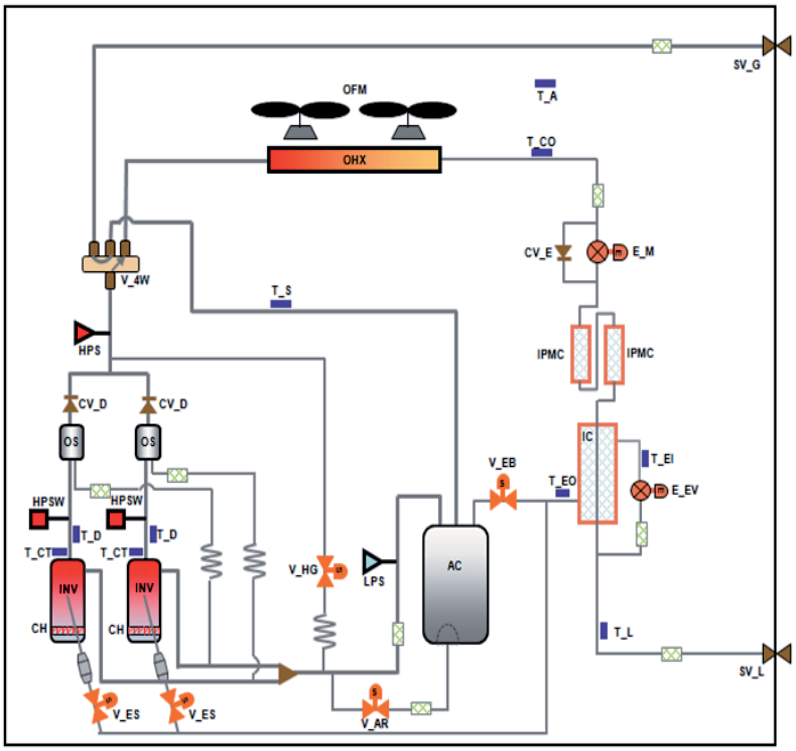
Abbreviation	Name
INV	Inveter Compressor
OFM	Outdoor Fan Motor
OHX	Outdoor Heat Exchanger
AC	Accumulator
OS	Oil Separator
IC	Intercooler
IPMC	IPM Cooler
CH	Crank Case Heater
HPS	High Pressure Sensor
LPS	Low Pressure Sensor
HPSW	High Pressure Switch
E_M	Main EEV
E_EV	EVI EEV
V_ES	EVI Sol. Valve
V_EB	EVI Bypass Valve
V_HG	Hot Gas Bypass Valve
V_4W	4Way Valve
V_AR	Accumulator Oil Return Valve
CV_E	EEV Bypass Check Valve
CV_D	Discharge Check Valve
T_D	Discharge Temperature Sensor
T_S	Suction Temperature Sensor
T_CO	Cond. Out Temperature Sensor
T_EI	EVI In Temperature Sensor
T_EO	EVI Out Temperature Sensor
T_L	Liquid Pipe Temperature Sensor
T_CT	Comp. Top Temperature Sensor
T_A	Ambient Temperature Sensor
SV_G	Gas Pipe Service Valve
SV_L	Liquid Pipe Service Valve

7-2 AM140FXVAGH/EU



Abbreviation	Name
INV	Inveter Compressor
OFM	Outdoor Fan Motor
OHX	Outdoor Heat Exchanger
AC	Accumulator
OS	Oil Separator
IC	Intercooler
IPMC	IPM Cooler
CH	Crank Case Heater
HPS	High Pressure Sensor
LPS	Low Pressure Sensor
HPSW	High Pressure Switch
E_M	Main EEV
E_EV	EVI EEV
V_ES	EVI Sol. Valve
V_EB	EVI Bypass Valve
V_HG	Hot Gas Bypass Valve
V_4W	4Way Valve
V_AR	Accumulator Oil Return Valve
CV_E	EEV Bypass Check Valve
CV_D	Discharge Check Valve
T_D	Discharge Temperature Sensor
T_S	Suction Temperature Sensor
T_CO	Cond. Out Temperature Sensor
T_EI	EVI In Temperature Sensor
T_EO	EVI Out Temperature Sensor
T_L	Liquid Pipe Temperature Sensor
T_CT	Comp. Top Temperature Sensor
T_A	Ambient Temperature Sensor
SV_G	Gas Pipe Service Valve
SV_L	Liquid Pipe Service Valve

7-3 AM160/180/200/220FXVAGH/EU



Abbreviation	Name
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IC	Intercooler
IPMC	IPM Cooler
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HPS	High Pressure Sensor
LPS	Low Pressure Sensor
HPSW	High Pressure Switch
E_M	Main EEV
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V_ES	EVI Sol. Valve
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CV_E	EEV Bypass Check Valve
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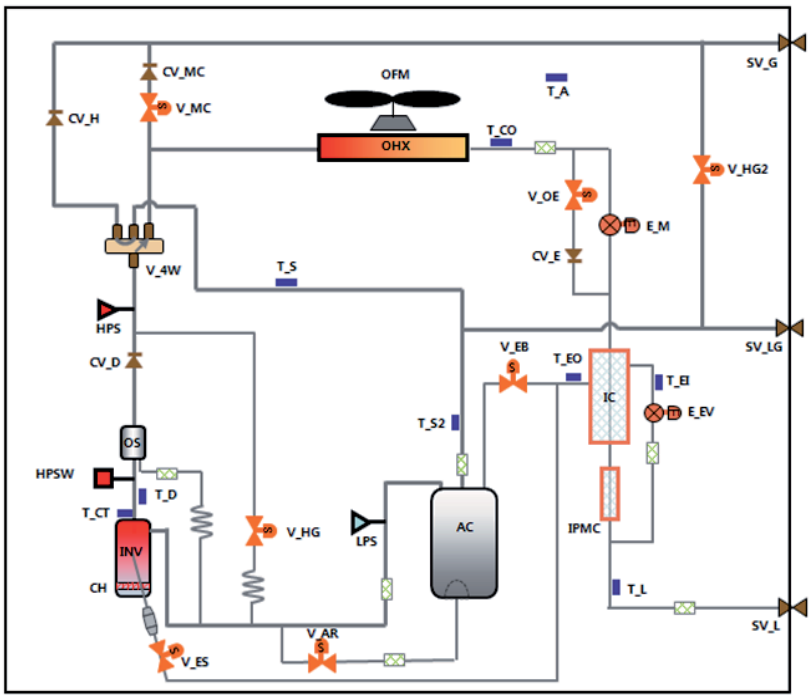
T_S	Suction Temperature Sensor
T_CO	Cond. Out Temperature Sensor
T_EI	EVI In Temperature Sensor
T_EO	EVI Out Temperature Sensor
T_L	Liquid Pipe Temperature Sensor
T_CT	Comp. Top Temperature Sensor
T_A	Ambient Temperature Sensor
SV_G	Gas Pipe Service Valve
SV_L	Liquid Pipe Service Valve

7-4 AM080/100/120FXVAGR/EU



Abbreviation	Name
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OHX	Outdoor Heat Exchanger
AC	Accumulator
OS	Oil Separator
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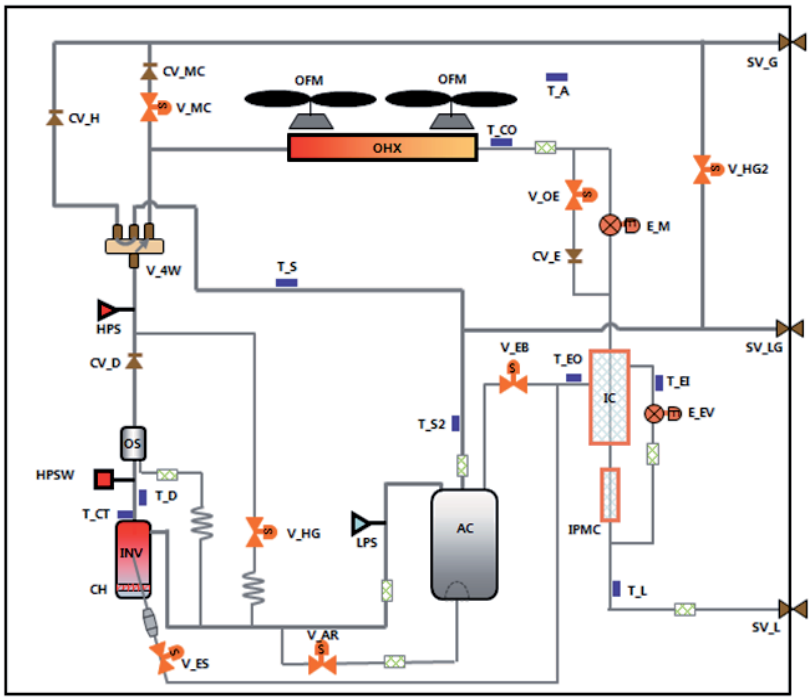
V_HG	Hot Gas Bypass Valve
V_HG2	Hot Gas Bypass Valve 2
V_4W	4Way Valve
V_AR	Accumulator Oil Return Valve
CV_E	EEV Bypass Check Valve
CV_D	Discharge Check Valve
CV_MC	MainCooling Check Valve
T_D	Discharge Temperature Sensor
T_S	Suction Temperature Sensor
T_S2	Suction Temperature Sensor 2
T_CO	Cond. Out Temperature Sensor
T_EI	EVI In Temperature Sensor
T_EO	EVI Out Temperature Sensor
T_L	Liquid Pipe Temperature Sensor
T_CT	Comp. Top Temperature Sensor
T_A	Ambient Temperature Sensor
SV_G	Gas Pipe Service Valve
SV_LG	Low P. Gas Pipe Service Valve
SV_L	Liquid Pipe Service Valve

7-5 AM140FXVAGR/EU



Abbreviation	Name
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AC	Accumulator
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V_HG2	Hot Gas Bypass Valve 2
V_4W	4Way Valve
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CV_D	Discharge Check Valve
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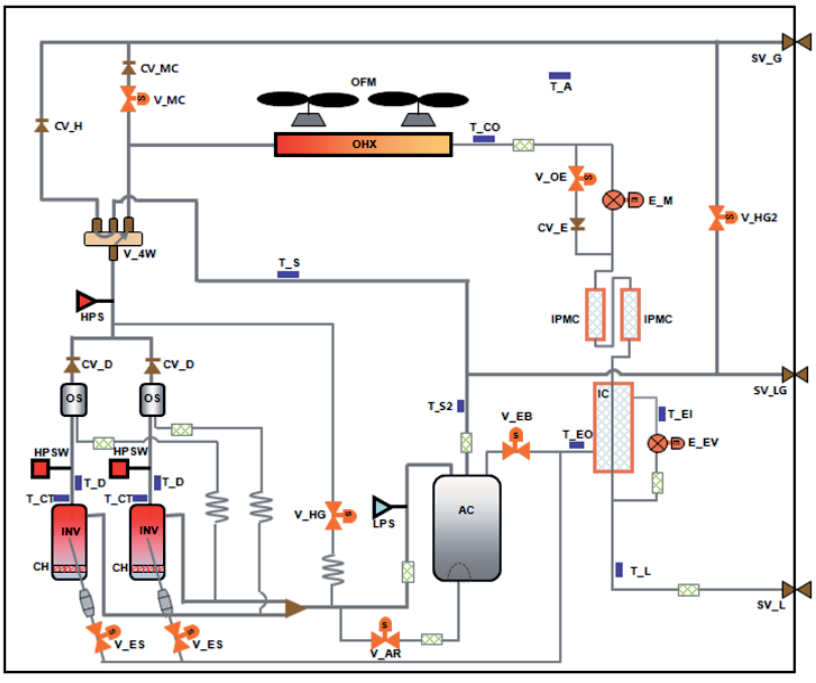
T_D	Discharge Temperature Sensor
T_S	Suction Temperature Sensor
T_S2	Suction Temperature Sensor 2
T_CO	Cond. Out Temperature Sensor
T_EI	EVI In Temperature Sensor
T_EO	EVI Out Temperature Sensor
T_L	Liquid Pipe Temperature Sensor
T_CT	Comp. Top Temperature Sensor
T_A	Ambient Temperature Sensor
SV_G	Gas Pipe Service Valve
SV_LG	Low P. Gas Pipe Service Valve
SV_L	Liquid Pipe Service Valve

7-6 AM160/180/200/220FXVAGR/EU



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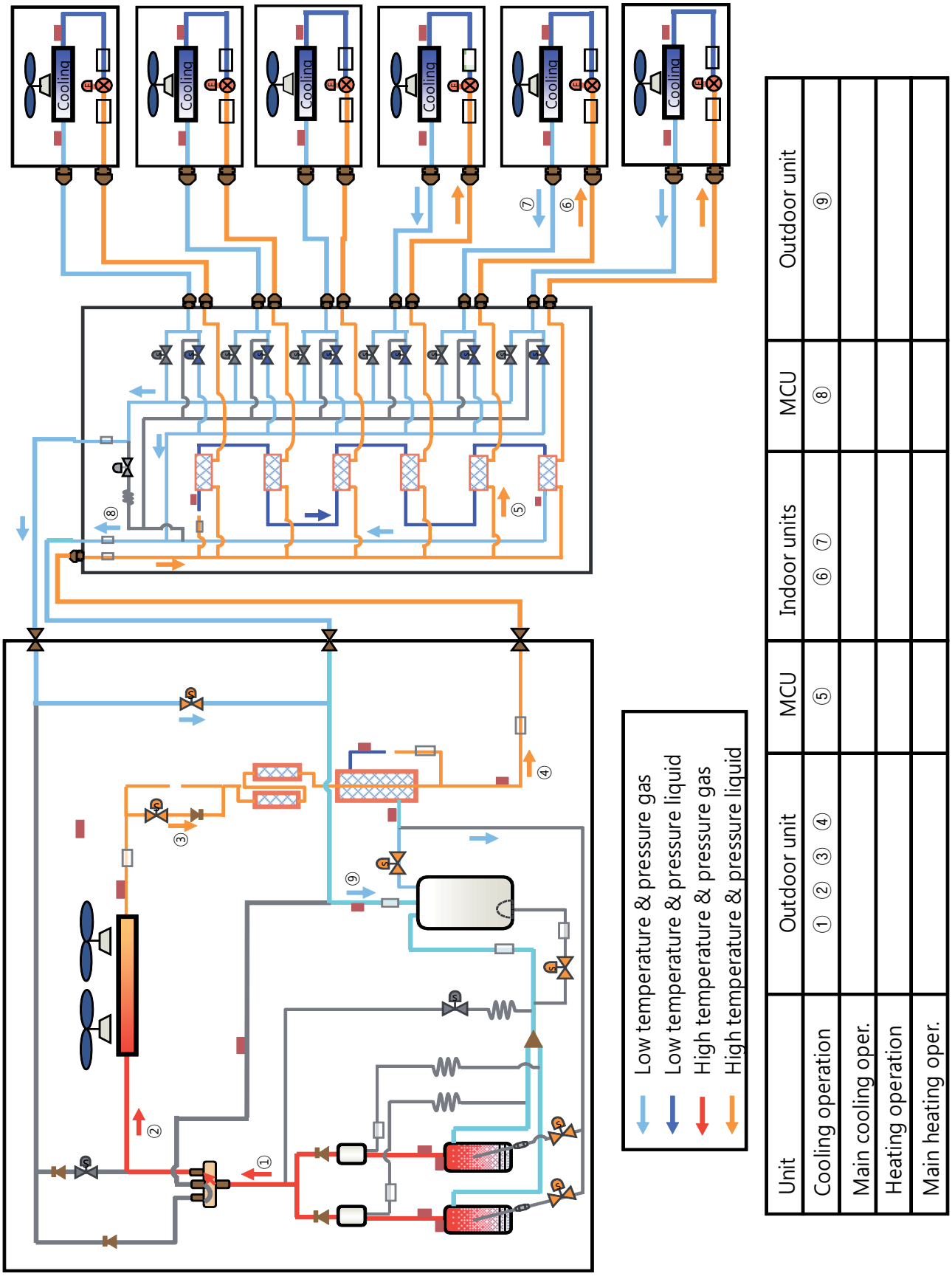
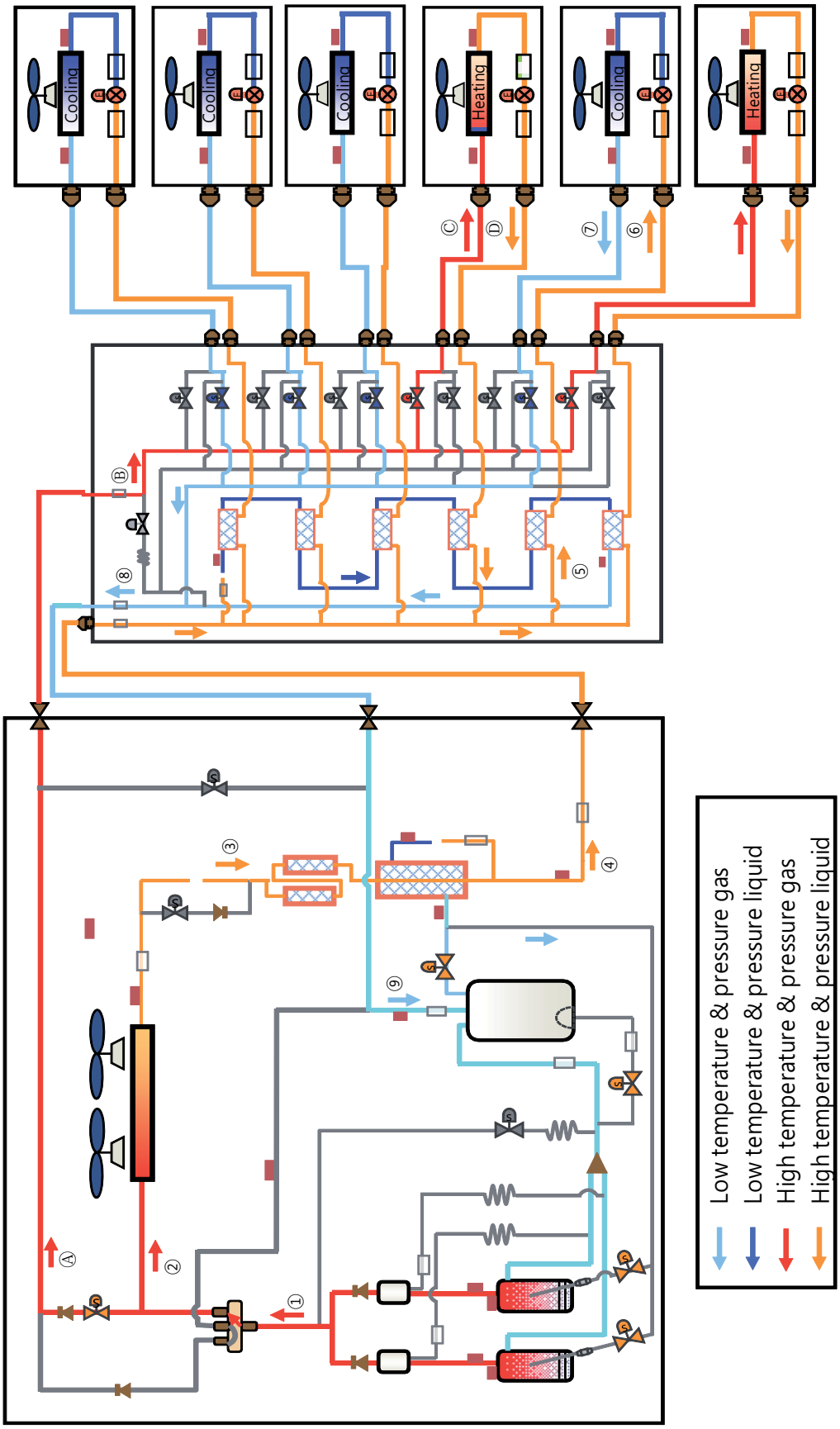
HPSW	High Pressure Switch
E_M	Main EEV
E_EV	EVI EEV
V_ES	EVI Sol. Valve
V_EB	EVI Bypass Valve
V_HG	Hot Gas Bypass Valve
V_HG2	Hot Gas Bypass Valve 2
V_4W	4Way Valve
V_AR	Accumulator Oil Return Valve
CV_E	EEV Bypass Check Valve
CV_D	Discharge Check Valve
CV_MC	MainCooling Check Valve
T_D	Discharge Temperature Sensor
T_S	Suction Temperature Sensor
T_S2	Suction Temperature Sensor 2
T_CO	Cond. Out Temperature Sensor
T_EI	EVI In Temperature Sensor
T_EO	EVI Out Temperature Sensor
T_L	Liquid Pipe Temperature Sensor
T_CT	Comp. Top Temperature Sensor
T_A	Ambient Temperature Sensor
SV_G	Gas Pipe Service Valve
SV_LG	Low P. Gas Pipe Service Valve
SV_L	Liquid Pipe Service Valve

7-7 Cooling operation (H/R)


Cooling
Low temperature & pressure gas
Low temperature & pressure liquid
High temperature & pressure gas
High temperature & pressure liquid

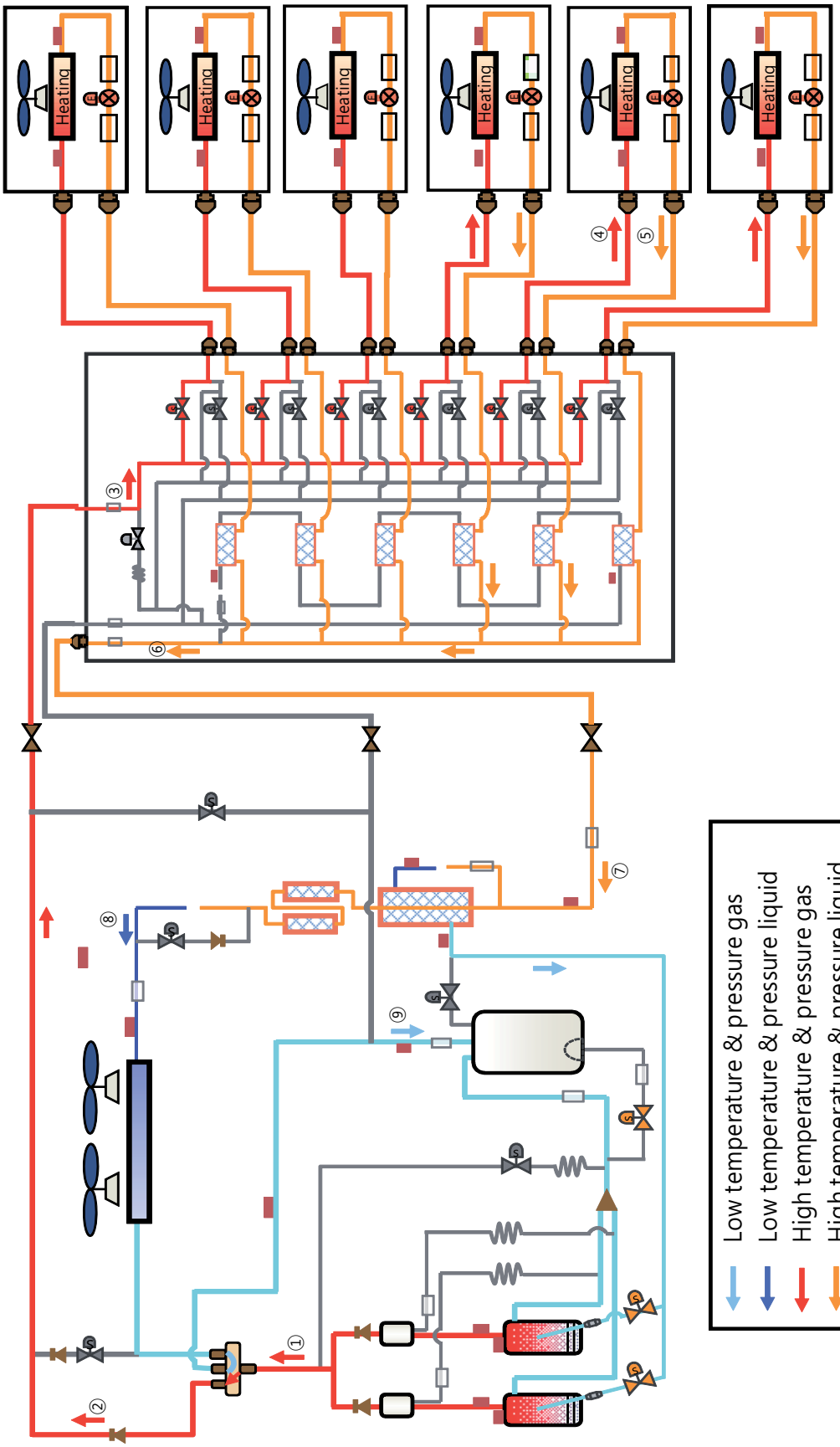
Unit	Outdoor unit	MCU	Indoor units	MCU	Outdoor unit
Cooling operation	① ② ③ ④	⑤	⑥ ⑦	⑧	⑨
Main cooling oper.					
Heating operation					
Main heating oper.					

7-8 Main cooling operation (H/R)



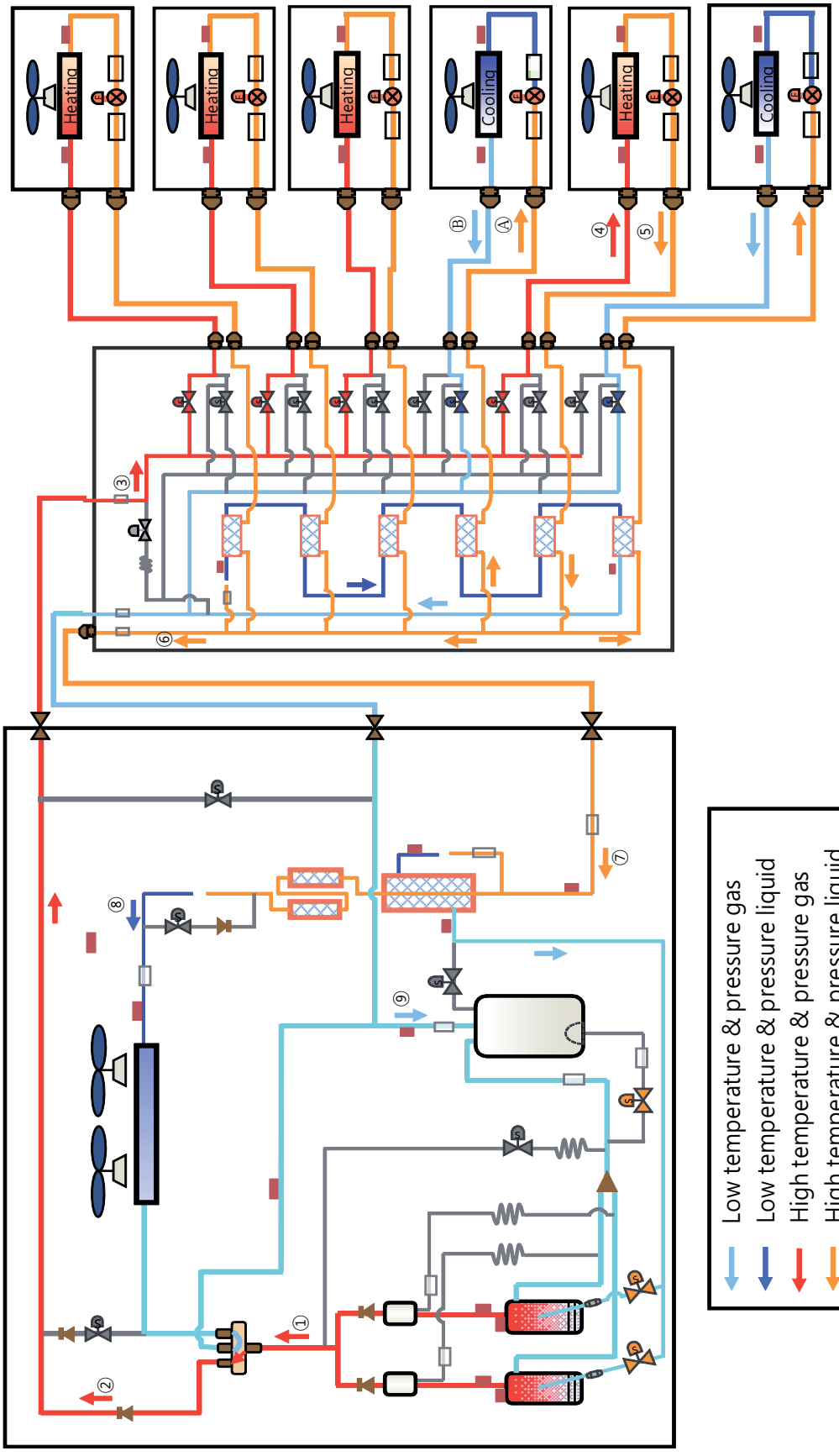
Unit	Outdoor unit	MCU	Indoor units	MCU	Outdoor unit
Cooling operation					
Main cooling oper.	① ② ③ ④ (Ⓐ)	⑤ (Ⓑ)	⑥ ⑦ (Ⓒ Ⓓ)	⑧	⑨
Heating operation					
Main heating oper.					

7-9 Heating operation (H/R)



Unit	Outdoor unit	MCU	Indoor units	MCU	Outdoor unit
Cooling operation					
Main cooling oper.					
Heating operation	① ②	③	④ ⑤	⑥	⑦ ⑧ ⑨
Main heating oper.					

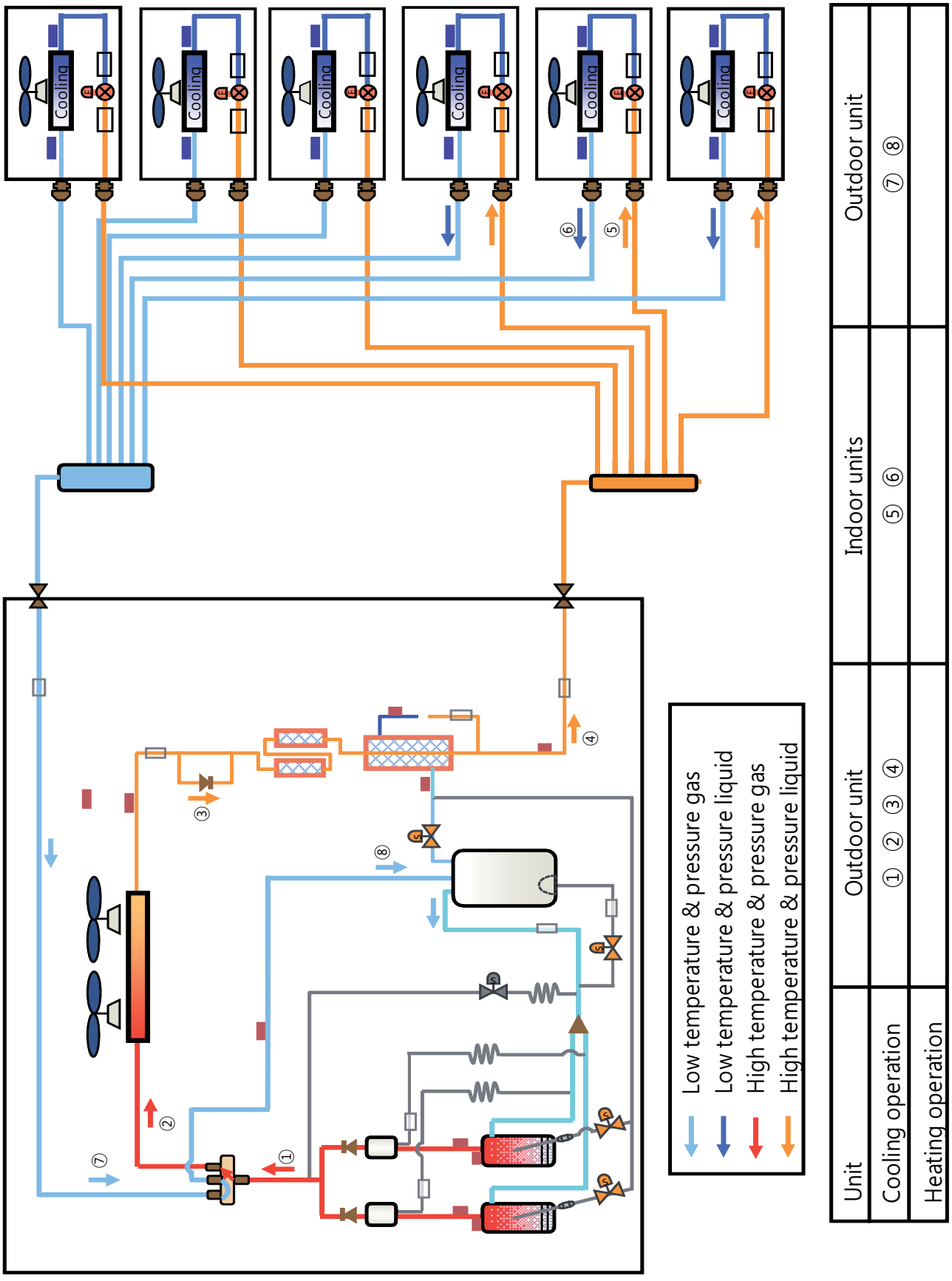
7-10 Main heating operation (H/R)



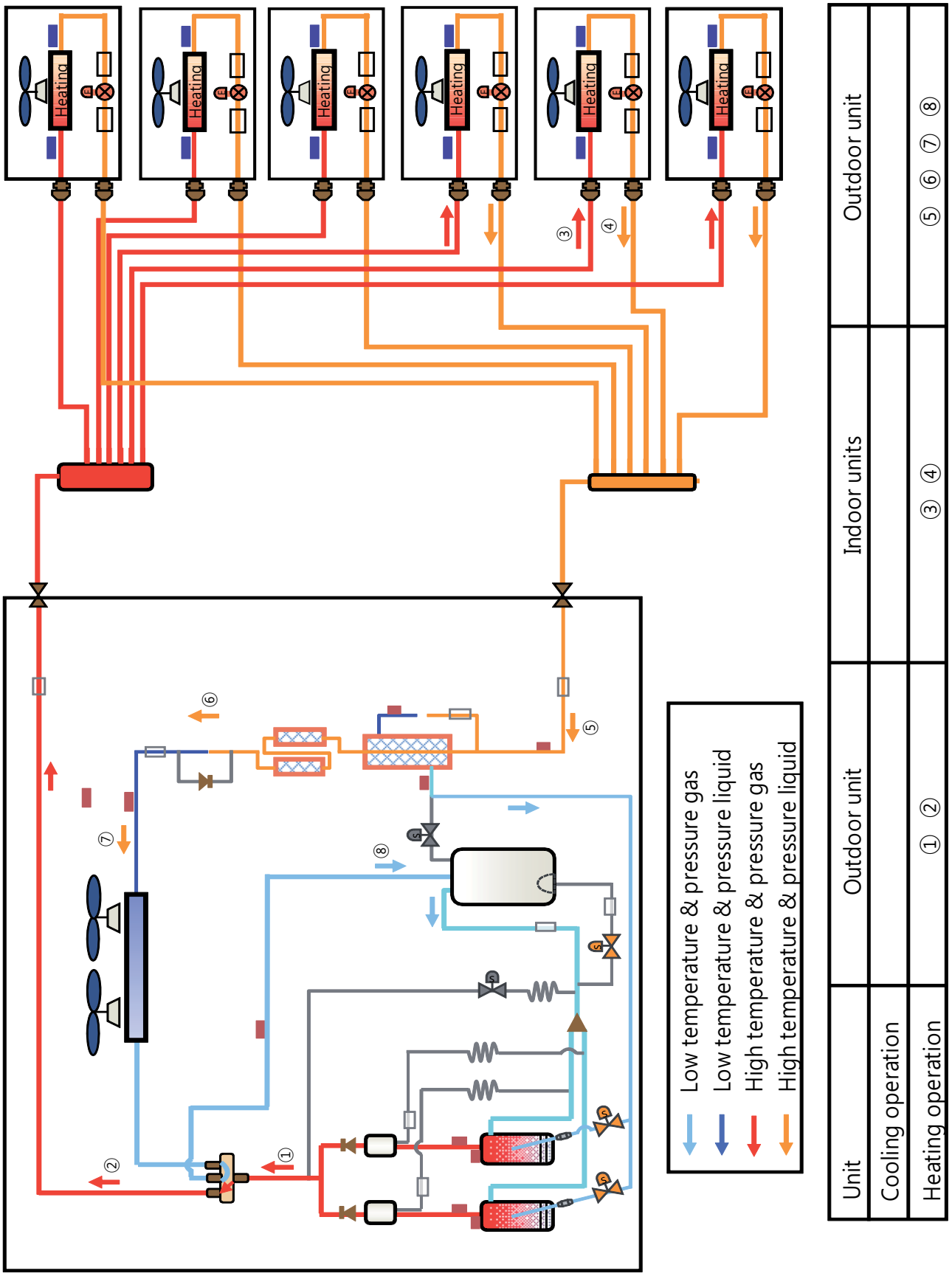
Low temperature & pressure gas
Low temperature & pressure liquid
High temperature & pressure gas
High temperature & pressure liquid

Unit	Outdoor unit	MCU	Indoor units	MCU	Outdoor unit
Cooling operation					
Main cooling oper.					
Heating operation					
Main heating oper.	① ②	③	④ ⑤ (Ⓐ Ⓑ)	⑥ (Ⓒ)	⑦ ⑧ ⑨

7-11 Cooling operation (H/P)



7-12 Heating operation (H/P)

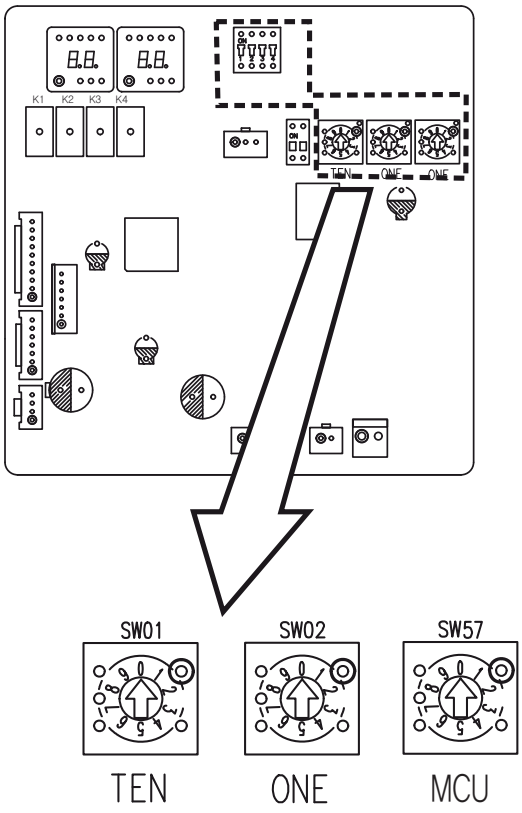


7-13 Cycle Component Function Explanation

1. Accumulator : Separating the incoming liquid refrigerant to the compressor in order to prevent liquid refrigerant.
2. Oil Separator : Separating the oil from the refrigerant discharged from the compressor, and the separated oil is returned to the compressor.
3. Intercooler : Supercooled liquid refrigerant through the heat exchanger and makes the medium pressure gas refrigerant injected into the compressor.
4. IPM Cooler : IPM (Intelligent Power Module) by cooling to prevent overheating.
5. High/Low Pressure Sensor : Measure high/low Pressure of system.
6. High Pressure Switch : Suspend immediately for protection of system if high pressure of system exceeds setting value.
7. Outdoor EEV (Main EEV) : Adjust the incoming refrigerant to the outdoor heat exchanger during heating operation.
8. EVI EEV : By adjusting the amount of refrigerant passing through the Subcooler to obtain the degree of supercooling and adjust the amount of gas refrigerant entering to the compressor.
9. 4Way Valve : Change the direction of flow of the refrigerant to the cooling / heating operation.
10. ARV (Accumulator Oil Return Valve) : Remaining at the bottom of the Accumulator recovered oil to the compressor.
11. MainCooling Valve : In the main cooling operation, sending the high pressure refrigerant to indoor unit in heating mode.
12. Outdoor EEV Valve : In the main cooling operation, It's closed so that the Outdoor EEV Valve can control the amount of the refrigerant.
13. Hotgas Valve : Sending the high pressure gas to low pressure pipe in order to protect low pressure.
14. Hotgas Valve 2 : In the cooling operation, changing high pressure pipe to low pressure pipe.
15. EVI SOL V : This valve opens when using the vapor Injection.
16. EVI BYPASS V : This valve opens in the sub cooling control. It's closed when using the vapor injection.
17. Discharge Temperature Sensor : Measure the temperature of the refrigerant discharged from the compressor.
18. Suction Temperature Sensor : Measure the temperature of the refrigerant to the compressor suction.
19. Cond. Out Temperature Sensor : Measure the temperature of the outdoor heat exchanger of the air conditioning operation.
20. EVI In/Out Temperature Sensor : Measure the temperature of the refrigerant inlet and outlet of the Subcooler.
21. Liquid Pipe Temperature Sensor : Measure the temperature of supercooling refrigerant in the outdoor unit of the air conditioning.
22. Comp. Top Temperature Sensor : Measure the temperature of compressor top cover.
23. Ambient Temperature Sensor : Measure the outdoor temperature.

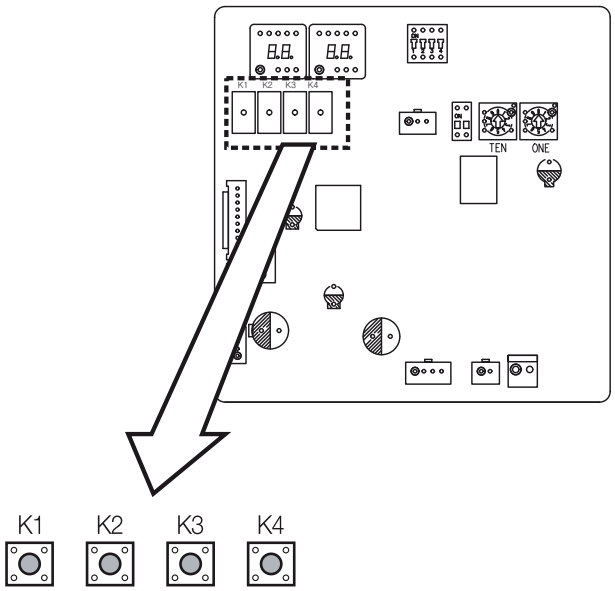
8. Key Options

8-1 Outdoor unit option switch settings



Switch	Setting		Setting	Remarks
SW51/ SW52			Setting total number of installed indoor unit SW51: Tens digit, SW52: Units digit	Setting can be done from the main outdoor unit only (sub unit: setting is nnecessary) Ex) When 12 indoor units are installed → SW51: 1, SW52: 2
	K6	ON	Enable maximum capacity restriction for cooling operation	Restrict excessive capacity increase when operating indoor units with small capacity
		OFF	Disable maximum capacity restriction for cooling operation	-
	K7	K8	Selecting outdoor unit address	
	ON	ON	Outdoor unit address: No 1	Main unit
	ON	OFF	Outdoor unit address: No 2	Sub unit 1
	OFF	ON	Outdoor unit address: No 3	Sub unit 2
	OFF	OFF	Outdoor unit address: No 4	Sub unit 3
SW57			Setting total number of connected MCU	Setting can be done from Main unit only. Ex) When 3 MCUs are installed → SW57: 3, When 10 MCUs are installed → SW57: A

8-2 How to set the key function of the outdoor unit



Tact switch installation and options of how to set up and functional description

■ Options of how to set up

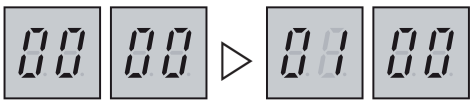
(1) Entry by pressing the K2 for a long time.(However, the operation is only possible during the stop.)

- Upon entering the following is displayed. (If the compressor is set truncation, 1 or 2 is displayed in Seg4.)

- Displays the number of the currently selected option. Seg1, Seg2.
- Displays the set value of the currently selected option. Seg3, Seg4.

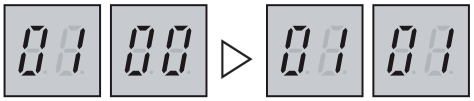
(2) After entering the option, briefly press the K1 switch will change the value of Seg1, Seg2 and then select the option to change.
(Option Seg numbers, see the table on page 39.)

Ex)



(3) Press the switch briefly to the option you want to change the items of K2 will change the value of Seg3, Seg4 and then select the option to change.

Ex)



(4) K2 switch is pressed for 2 seconds after the option is selected, 7-Segment entire blinks and enters the tracking mode, and the option value is saved.

- As described above, if you do not normal shutdown the option settings can not be saved.

※ Press K1 for a long time, if you want to go back to the settings before the entry while setting the option to cancel the setting.

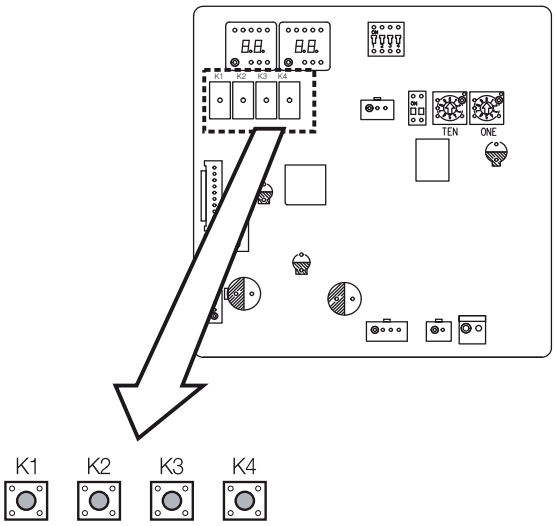
※ If you want the factory settings option in the setting mode, press K4 for a long time.

- K4 switch is pressed for a long time, all options settings return to the factory settings, but the settings are saved is not.
  K2 switch is pressed for a long time, 7-Segment enters the tracking mode and the settings will be saved.

How to set the key function of the outdoor unit (cont.)

Optional item	Input unit	SEG1	SEG2	SEG3	SEG4	Function of the option	Remarks
Emergency operation for compressor malfunction	Individual	0	0	0	0	Disabled (Factory default)	E560 will occur when all the compressors are set as malfunction state.
				0	1	Set compressor 1 as malfunction state	
				0	2	Set compressor 2 as malfunction state	
Capacity correction for cooling	Main	0	1	0	0	7-9 (Factory default)	Targeted evaporation temperature [°C] (When low temperature value is set, discharged air temperature of the indoor unit will decrease)
				0	1	5-7	
				0	2	9-11	
				0	3	10-12	
				0	4	11-13	
				0	5	12-14	
				0	6	13-15	
Capcity correction for heating	Main	0	2	0	0	3.0 (Factory default)	Targeted high pressure [MPa] (When low pressure value is set, discharged air temperature of the indoor unit will decrease)
				0	1	2.5	
				0	2	2.6	
				0	3	2.7	
				0	4	2.8	
				0	5	2.9	
				0	6	3.1	
				0	7	3.2	
				0	8	3.3	
Current restriction rate	Individual	0	3	0	0	100% (Factory default)	When restriction option is set, cooling and heating performance may decrease
				0	1	95 %	
				0	2	90 %	
				0	3	85 %	
				0	4	80 %	
				0	5	75 %	
				0	6	70 %	
				0	7	65 %	
				0	8	60 %	
				0	9	55 %	
				1	0	50 %	
				1	1	No restriction	
Oil collection interval	Main	0	4	0	0	Factory default	
				0	1	Shorten the interval by 1/2	
Temperature to trigger defrost operation	Main	0	5	0	0	Factory default	
				0	1	Apply setting when the product is being installed in humid area such as near river or lake	
Fan speed correction for outdoor unit	Individual	0	6	0	0	Factory default	
				0	1	Increase fan speed	Increase the outdoor unit's fan speed to maximum value
Silent mode for night-time	Main	0	7	0	0	Disabled (Factory default)	
				0	1	LEVEL 1	Enable silent mode for night-time
				0	2	LEVEL 2	
				0	3	LEVEL 3	
High-head condition setting	Main	0	8	0	0	Disabled (Factory default)	
				0	1	Level 1 of height difference type 1 (Indoor unit is lower than outdoor unit)	When outdoor unit is located 40~80m above the indoor unit
				0	2	Level 2 of height difference type 1 (Indoor unit is lower than outdoor unit)	When outdoor unit is located over 80m above the indoor unit
				0	3	Height difference type 2 (Outdoor unit is lower than indoor unit)	When indoor unit is over 30 m above the outdoor unit
Long-piping condition setting (Setting is unnecessary if high-head condition is set)	Main	0	9	0	0	Disabled (Factory default)	
				0	1	LEVEL 1	When equivalent length of farthest indoor unit from the outdoor unit is between 100~170m
				0	2	LEVEL 2	When equivalent length of farthest indoor unit from the outdoor unit is over 170m
Energy saving setting	Main	1	0	0	0	Disabled (Factory default)	
				0	1	Enabled	Energy saving mode triggers when the room temperature reaches desired temperature while operating in heating mode.
Rotation defrost (HR only)	Main	1	1	0	0	Disabled (Factory default)	
				0	1	Enabled	When enabled, continuous heating operation is possible but heating performance will decrease during rotation defrost operation
Expand operational temperature range for cooling operation	Main	1	2	0	0	Disabled (Factory default)	
				0	1	Enabled	When enabled, continuous cooling operation is possible even in low temperature condition up to -15°C, but noise of the MCU will increase
Channel address	Main	1	3	A	U	Automatic setting (Factory default)	Address for classifying the product from upper level controller (DMS, S-NET 3, etc.)
				0~15		Manual setting for channel 0~15	
Snow accumulation prevention control	Main	1	4	0	0	Enabled (Factory default)	During snow accumulation prevention, the fan may spin even when the unit is not in operation
				0	1	Disabled	

8-3 How to check the view mode using a tact switch



K3 (Number of press)	Key operation	Display on segment
1 time	Intialize (Reset) setting	Same as initial state

K4 (Number of press)	Key operation	Display on segment	
		SEG 1	SEG 2, 3, 4
1 time	Outdoor unit model	1	AM160FXV✳✳✳✳ → 0ff, 1, 6
2 times	Order frequency of the compressor 1	2	120 Hz → 1, 2, 0
3 times	Order frequency of the compressor 2	3	120 Hz → 1, 2, 0
4 times	High pressure (MPa)	4	1.52 MPa → 1, 5, 2
5 times	Low pressure (MPa)	5	0.43 MPa → 0, 4, 3
6 times	Discharge temperature (Compressor 1)	6	87 °C → 0, 8, 7
7 times	Discharge temperature (Compressor 2)	7	87 °C → 0, 8, 7
8 times	IPM temperature (Compressor 1)	8	87 °C → 0, 8, 7
9 times	IPM temperature (Compressor 2)	9	87 °C → 0, 8, 7
10 times	CT sensor value (Compressor 1)	A	2 A → 0, 2, 0
11 times	CT sensor value (Compressor 2)	B	2 A → 0, 2, 0
12 times	Suction temperature	C	-42 °C → -, 4, 2
13 times	COND OUT temperautre	D	-42 °C → -, 4, 2
14 times	Temperature of liquid pipe	E	-42 °C → -, 4, 2
15 times	TOP temperature (Compressor 1)	F	87 °C → 0, 8, 7
16 times	TOP temperature (Compressor 2)	G	87 °C → 0, 8, 7
17 times	Outdoor temperature	H	-42 °C → -, 4, 2
18 times	EVI inlet temperature	I	-42 °C → -, 4, 2
19 times	EVI outlet temperature	J	-42 °C → -, 4, 2
20 times	Main EEV1 step	K	2000 → 2, 0, 0
21 times	Main EEV2 step	L	2000 → 2, 0, 0
22 times	EVI EEV step	M	300 → 3, 0, 0
23 times	HR EEV step	N	300 → 3, 0, 0
24 times	Fan step (SSR or BLDC)	O	13 STEP → 0, 1, 3
25 times	Current frequency (Compressor 1)	P	120 Hz → 1, 2, 0
26 times	Current frequency (Compressor 2)	Q	120 Hz → 1, 2, 0
27 times	Suction 2 temperature (HR Only)	R	-42 °C → -, 4, 2
28 times	Master Indoor Unit Address	S	master indoor unit not selected → BLANK, N, D if indoor unit no.1 is selected as the master unit → 0, 0, 1

❉ When you install the product, optional function for outdoor unit must be set in compliance with installation conditions.

❉ Press and hold the K4 button for 5 seconds to check the SW version and address of the indoor units. (Information will be displayed in following order; Main-Hub-INV1-INV2-FAN1-FAN2-EEP-Automatically assigned address - Manually assigned address)

❉ Display method of automatically assigned addresses in K4 View mode (Ex: "AUTO" → "A001" → "AUTO" → "A002" → "AUTO" → "A003")

Page1	Display		
	Page2		
AUTO	SEG1	SEG2	SEG3,4
	Indoor unit: "A" MCU: "C"	Indoor unit: "0" MCU: "1"	Address (No. 1 → 0,1)

❉ Display method of manually assigned addresses in K4 View mode (Ex: "MANU" → "A004" → "MANU" → "A005" → "MANU" → "A006")

Page1	Display		
	Page2		
MANU	SEG1	SEG2	SEG3,4
	Indoor unit: "A"	Indoor unit: "0"	Address (No. 1 → 0,1)

9. Test Operation

9-1 Auto Trial Operation

9-1-1 Auto Trial Operation Synopsis

1) What is the Auto Trial Operation?

DVM S main components defective check and check the status of the installation, provide guidelines that can promptly and accurately resolve the problems that may occur in the field.
If does not end the Auto Trial Operation, normal operation is impossible to enter, it should protect the system from the abnormal state. ("UP")

2) Auto Trial Operation Preliminary checking.

(1) Check the Power cable of Indoor / Outdoor Unit and communication wire.

(2) Turn on the power 6 hours before to start the Auto Trial Operation.
(Crankcase heater to be heated sufficiently.)

(3) Check before applying power voltage and phase using a phase tester and voltmeter.
- R, S, T, N Terminal : Check the between the wire, 380V (R-S, S-T, T-R) / phase-to-phase, 220V (R-N, S-N, T-N).

(4) Power on, perform the tracking. (Outdoor Unit inspects Indoor Unit and optional.)

(5) Card to verify the installation of the control box front : must be record the installation details.

※ Necessarily turn on the power 6 hours before to start the Auto Trial Operation.

3) How to use the Auto Trial Operation.

(1) If does not complete the Auto Trial Operation, normal operation is prohibited.

- If does not complete the Auto Trial Operation, Display the "UP"(Unprepared) on the LED after checking communication.
(Compressor to operate normal operation is prohibited.)

※ UP Mode will be turned off automatically at finished the Auto Trial Operation.

- Auto Trial Operation is carried out by the operating conditions.
(From 20 minutes to maximum 2 hours)
- During Auto Trial Operation due to the valve check, the noise can be generated.
(Sustained abnormal noise occurs, check it)

(2) When an error occurs during the Auto Trial Operation, check the error code in the product and then service it.

(3) Shut down the Auto Trial Operation, resulting report will be issued using the S-NET or S-CHECKER.

- The resulting report of the "Undetermined"item, troubleshoot the accordance with the service manual.
- Troubleshoot all the items of "Undetermined" and then restart the Auto Trial Operation.

(4) Check the following as Trial Operation. (Heating / Cooling)

- Check the Cooling and Heating operation is progressing well.
- Individual Indoor Unit control : check the wind direction, wind speed.
- Check the Indoor and Outdoor abnormal noise.
- Check the drainage of the Indoor Unit cooling operation.
- More operation : Checking status by using the S-NET.

(5) Refer to manual and explain air conditioner usage to user.

※ If out of warranty coverage and bounds, installation, operation according to the conditions the some of items displayed as "Undetermined" and judgment is not.
Ex) system that module installed : If the outdoor unit is not operation by the load on the indoor and outdoor, corresponding Sub Outdoor Unit does not judge the inspection entries. (However, Indoor / Outdoor Temperature sensor and Pressure sensor judgment is available.)

※ Operation must close the upper and lower cabinets on the front of the Outdoor Unit.
If the cabinet opened while operation : Can cause damage to the product and can not get the exact S-NET data.

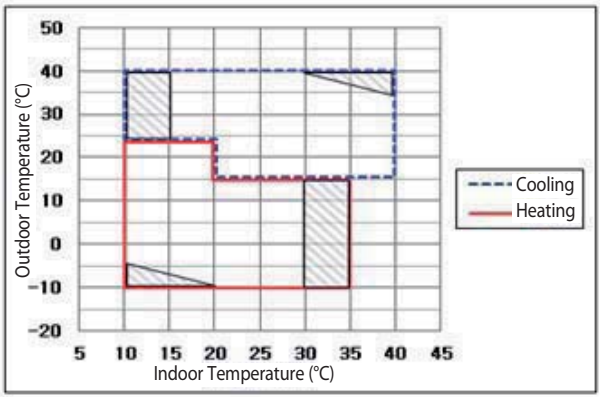
4) Inspection item of the Auto Trial Operation

During the Auto Trial Operation of the DVM S, defect check items are as follows.

- Indoor Unit Temperature sensor (Indoor temperature of each Indoor Unit, EVA In/Out Temperature sensor)
- Outdoor Unit Temperature sensor
  (Outdoor temperature of each Outdoor Unit, Cond_Out, EVI In/Out, Suction, Liquid Pipe Temperature sensor)
- Outdoor Unit High Pressure sensor & Low Pressure sensor
- Outdoor Unit Service Valve : judgment of the Open/Closed
- Outdoor Unit Compressor : Judgment of the operation current
- Cycle state judgment of the Outdoor Unit
- Outdoor Unit 4Way Valve : Judgment of the operation
- Outdoor Unit EVI EEV : Judgment of the operation
  (※ The operation mode of the Auto Trial Operation : "Heating" only if the detection.)

5) Warranty Coverage of the Auto Trial Operation

As follows, in order to accurately measure Indoor / Outdoor temperature conditions in the Auto Trial Operation is carried out.



- Heating / Cooling mode is automatically selected of Auto Trial Operation .
- Oblique line marked area in the during operation of the system can be protection control.
  (Auto Trial Operation of normal judgment can be difficult by the protection control operation.)
- If out of warranty coverage and the boundary area : Auto Trial Operation judgment accuracy may be reduced.

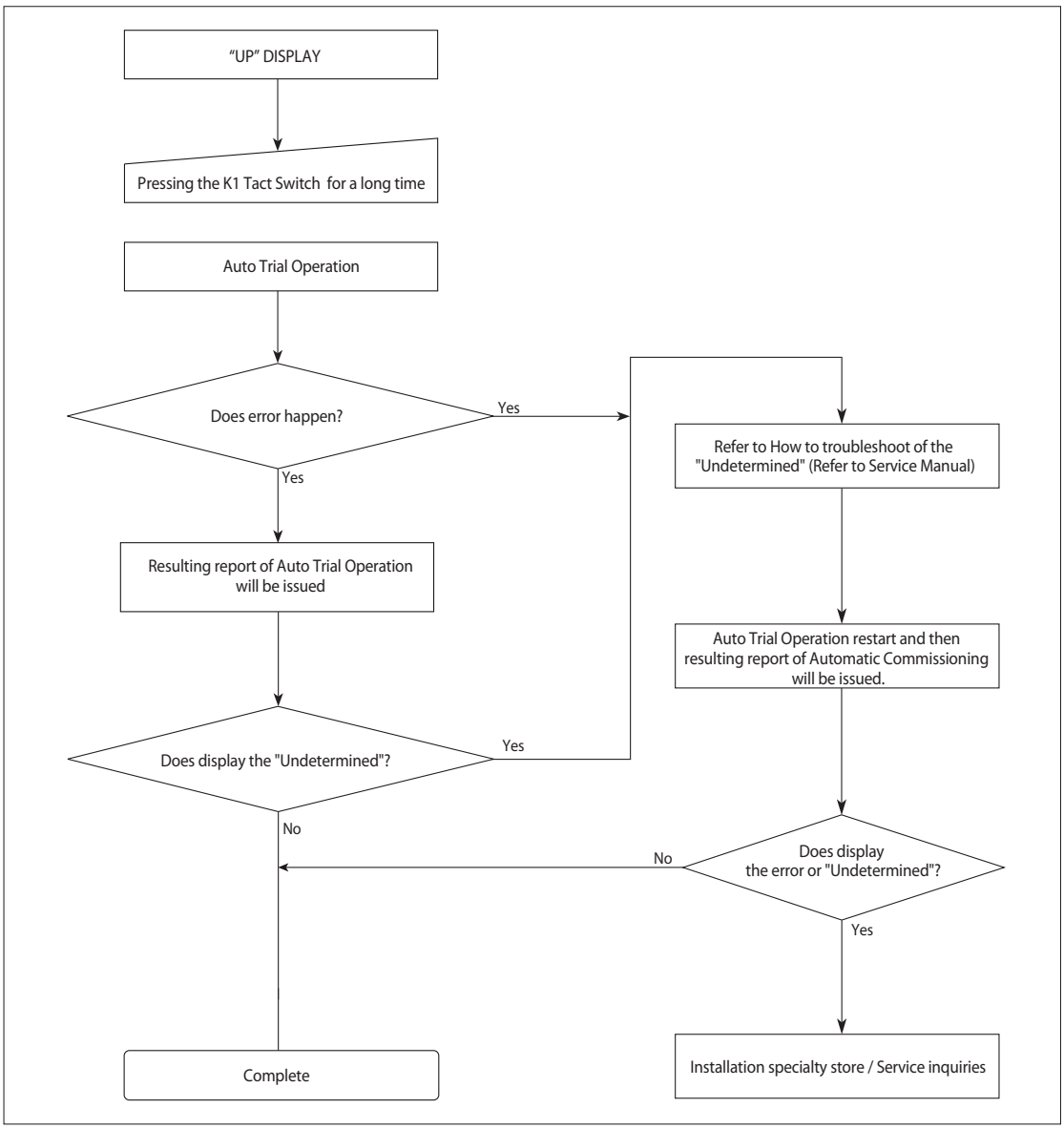
9-1-2 Auto Trial Operation functions

1)Preliminary checking and Auto Trial Operation flow chart

(1) Preliminary checking

- Check the installation status : Outdoor and Indoor Unit piping, Communication, Power, Amount of refrigerant added, etc.

(2) Auto Trial Operation methods


"UP" DISPLAY
Pressing the K1 Tact Switch for a long time
Auto Trial Operation
Does error happen?
Yes
Yes
Refer to How to troubleshoot of the "Undetermined" (Refer to Service Manual)
Resulting report of Auto Trial Operation will be issued
Auto Trial Operation restart and then resulting report of Automatic Commissioning will be issued.
Does display the "Undetermined"?
Yes
No
No
Does display the error or "Undetermined"?
Yes
Complete
Installation specialty store / Service inquiries

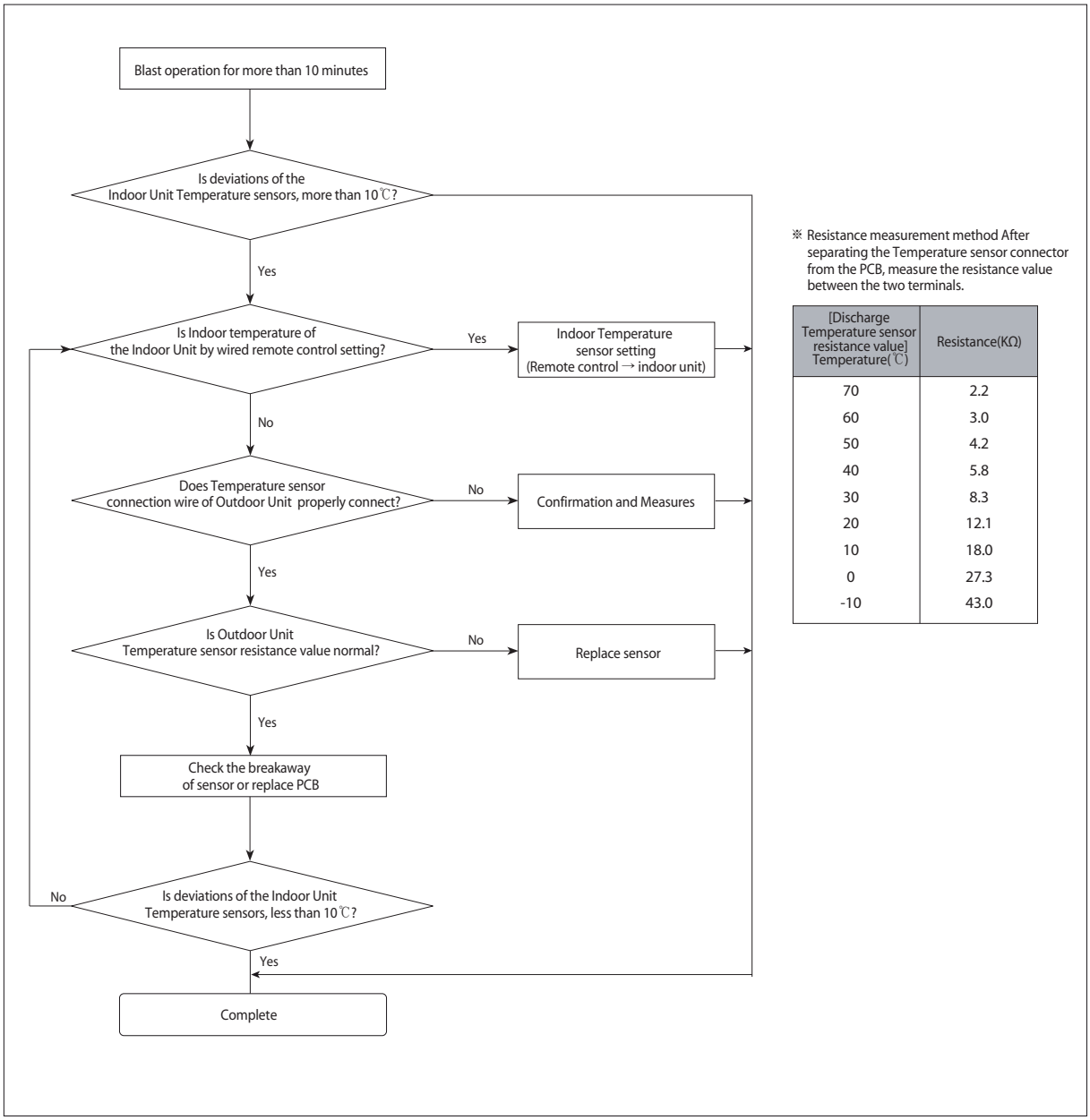
(3) Other Precautions

- If the problem of more than one components at the same time occurs, accurate decisions can be difficult.
- If stop the Sub outdoor during the Auto Trial Operation by load conditions in status of module combination, Outdoor Unit does not judge. (Undetermined)
- If the Outdoor Unit with a history of operation (Auto Trial Operation inclusion) : Must be carried out Auto Trial Operation after 1 hour from final operation stopped. (In this case, the vacuum mode of the air must maintain for more than 5 minutes.)
- Restart of Auto Trial Operation after troubleshoot the item that "Undetermined"

9-1-3 How to troubleshoot of the "Undetermined"

1) Indoor Unit Temperature sensor

- ■ Inspection item : Indoor temperature of each Indoor Unit, EVA In / Out Temperature sensor
- ■ Error code: None (The resulting report "Undetermined")
- ■ Determine the status of the Temperature sensor of the Indoor Unit installed before the compressor start.
- ■ If the judgment of Indoor Unit temperature sensor is "Undetermined" : Checking in accordance with the following order.


Blast operation for more than 10 minutes
Is deviations of the Indoor Unit Temperature sensors, more than 10℃?
Yes
Is Indoor temperature of the Indoor Unit by wired remote control setting?
Yes
Indoor Temperature sensor setting (Remote control → indoor unit)
No
Does Temperature sensor connection wire of Outdoor Unit properly connect?
No
Confirmation and Measures
Yes
Is Outdoor Unit Temperature sensor resistance value normal?
No
Replace sensor
Yes
Check the breakaway of sensor or replace PCB
No
Is deviations of the Indoor Unit Temperature sensors, less than 10℃?
Yes
Complete

※ Resistance measurement method After separating the Temperature sensor connector from the PCB, measure the resistance value between the two terminals.

[Discharge Temperature sensor resistance value] Temperature(℃)	Resistance(KΩ)
70	2.2
60	3.0
50	4.2
40	5.8
30	8.3
20	12.1
10	18.0
0	27.3
-10	43.0

[Caution]

- If the Outdoor Unit with a history of operation (Auto Trial Operation inclusion) :
  Must be carried out Auto Trial Operation after 1 hour from final operation stopped.
- If the Indoor temperature setting by wired remote control :
  Carried out the Auto Trial Operation after setting the Temperature sensor of Indoor Unit.
- Indoor Unit of outdoor air introduction : Will be excluded from the Indoor air temperature, EVA In / Out Temperature sensor checking.

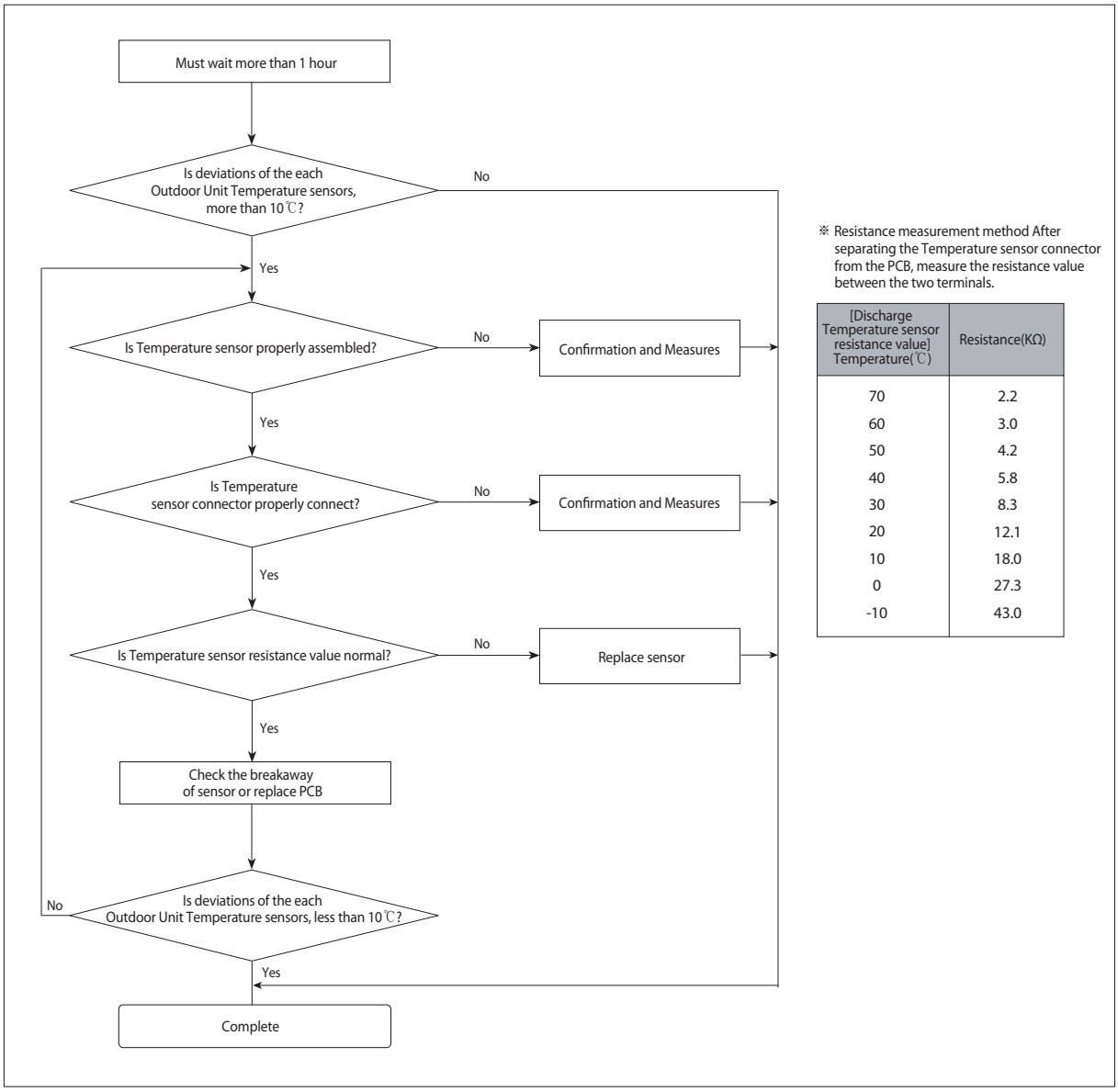
2) Outdoor Unit Temperature sensor

■ Inspection item : Outdoor temperature of each Outdoor Unit, Cond_Out, EVI In / Out, Suction, Liquid pipe temperature sensor

■ Error code: None (The resulting report "Undetermined")

■ Determine the status of the Temperature sensor of the each Outdoor Unit installed before the compressor start.

■ If the judgment of Outdoor Unit Temperature sensor is "Undetermined" : Checking in accordance with the following order.



※ Resistance measurement method After separating the Temperature sensor connector from the PCB, measure the resistance value between the two terminals.

[Discharge Temperature sensor resistance value] Temperature(℃)	Resistance(KΩ)
70	2.2
60	3.0
50	4.2
40	5.8
30	8.3
20	12.1
10	18.0
0	27.3
-10	43.0

[Caution]

- If the Outdoor Unit with a history of operation (Auto Trial Operation inclusion) : Must be carried out Auto Trial Operation after 1 hour from final operation stopped.

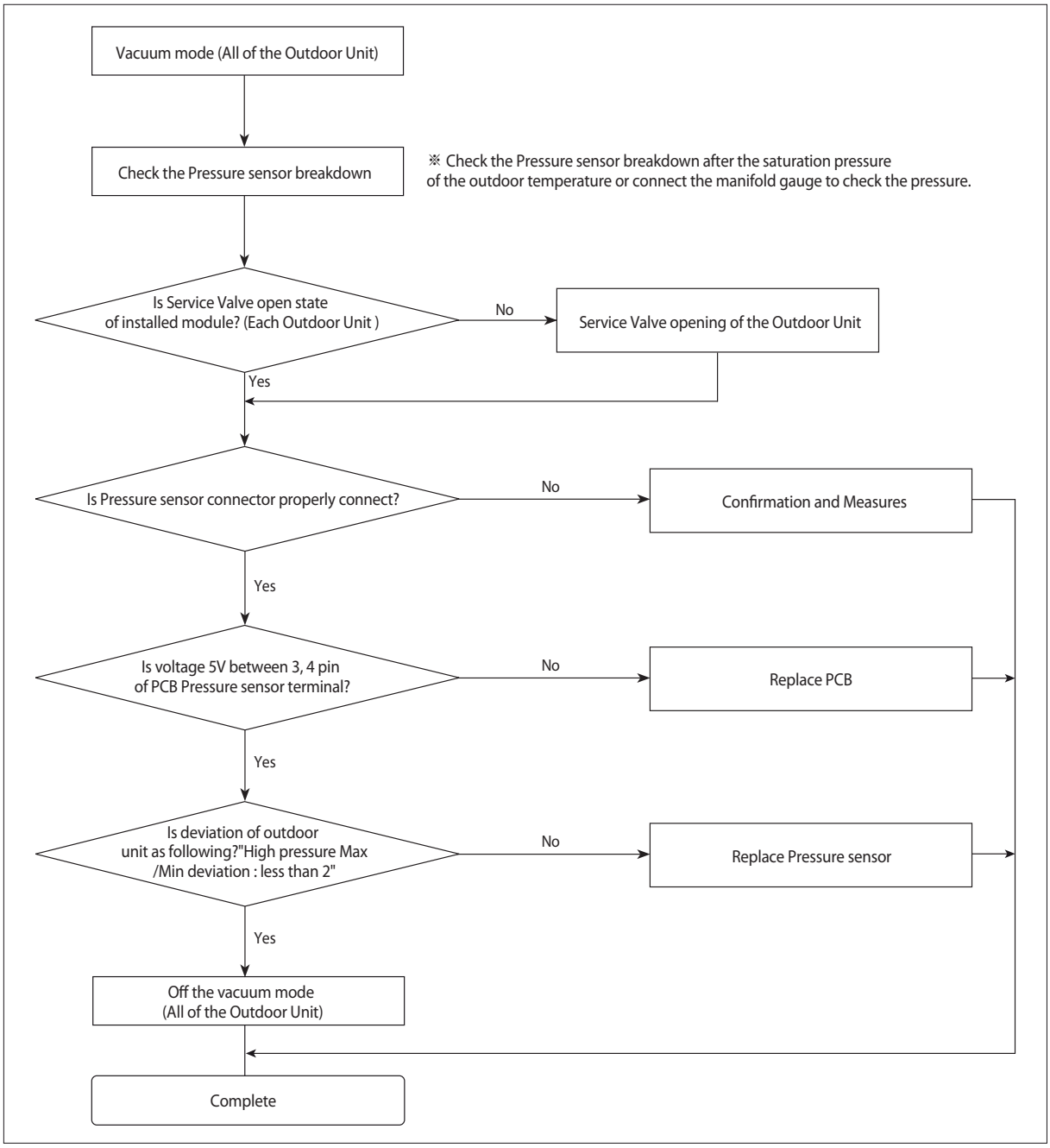
3) High / Low pressure sensor (Module installed)

■ High/Low Pressure sensor of each of the outdoor unit that module is installed.

■ Error code of High Pressure sensor : E505 (The resulting report "Undetermined")
Error code of Low Pressure sensor : E506 (The resulting report "Undetermined")

■ Determine the status of the High/Low Pressure sensor of the each Outdoor Unit installed before the compressor start.

■ If the judgment of Outdoor Unit High/Low Pressure sensor is "Undetermined" : Checking in accordance with the following order.


Vacuum mode (All of the Outdoor Unit)
Check the Pressure sensor breakdown
※ Check the Pressure sensor breakdown after the saturation pressure of the outdoor temperature or connect the manifold gauge to check the pressure.
Is Service Valve open state of installed module? (Each Outdoor Unit)
No
Service Valve opening of the Outdoor Unit
Yes
Is Pressure sensor connector properly connect?
No
Confirmation and Measures
Yes
Is voltage 5V between 3, 4 pin of PCB Pressure sensor terminal?
No
Replace PCB
Yes
Is deviation of outdoor unit as following?"High pressure Max /Min deviation : less than 2"
No
Replace Pressure sensor
Yes
Off the vacuum mode (All of the Outdoor Unit)
Complete

[Caution]

- If the judgment of Pressure sensor "Undetermined" :
  Display the error to all of the Outdoor Unit and then Auto Trial Operation is exited. (Stop the overall system)

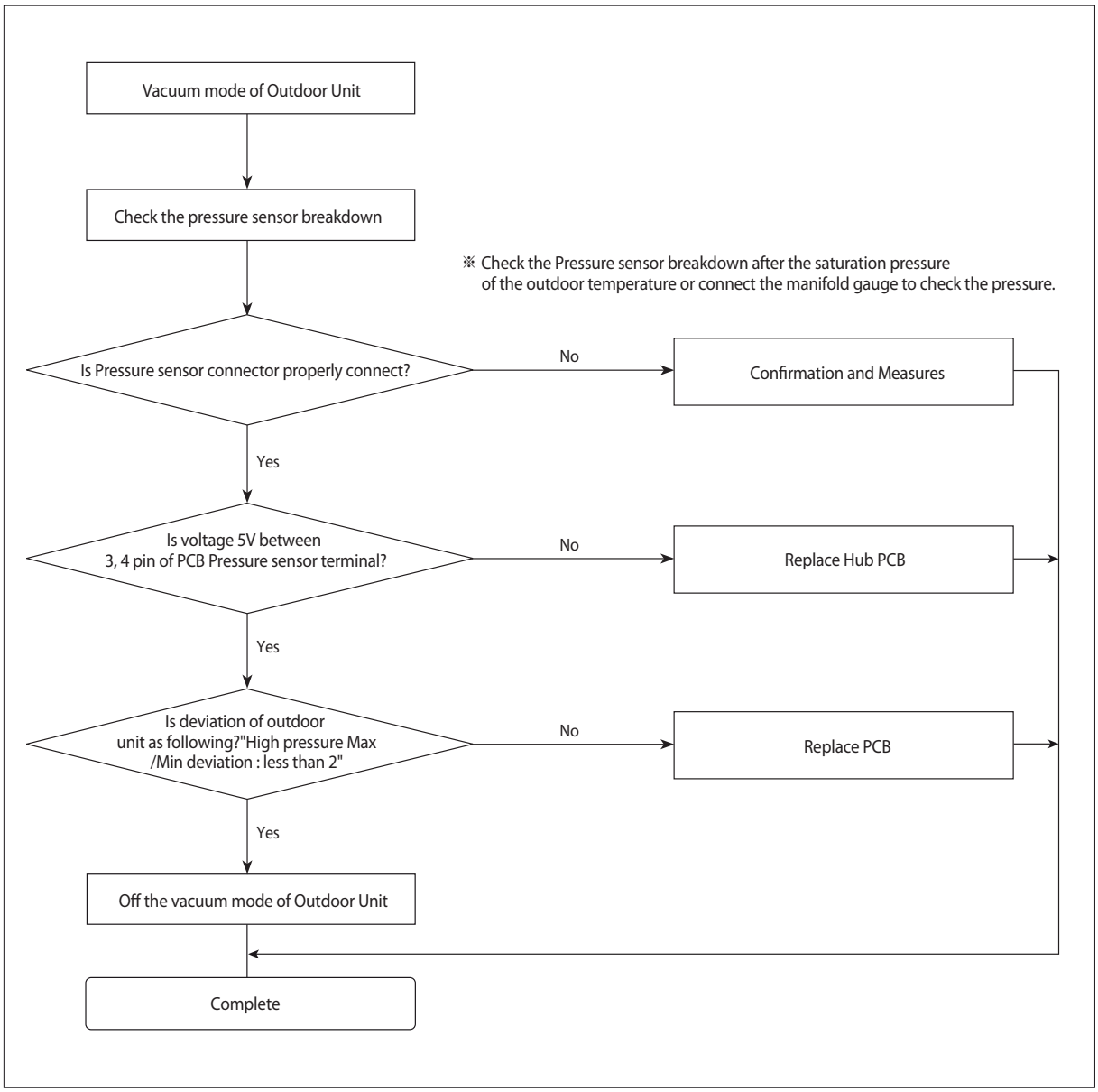
4) Pressure sensor (Independent installation)

■ Inspection item : High/Low Pressure sensor of the independent installed Outdoor Unit.

■ Error code: None (The resulting report "Undetermined")

■ Determine the status of the Pressure sensor of the independent installed Outdoor Unit before the compressor start.

■ If the judgment of Outdoor Unit Pressure sensor is "Undetermined" : Checking in accordance with the following order.


Vacuum mode of Outdoor Unit
Check the pressure sensor breakdown
※ Check the Pressure sensor breakdown after the saturation pressure of the outdoor temperature or connect the manifold gauge to check the pressure.
Is Pressure sensor connector properly connect?
No
Confirmation and Measures
Yes
Is voltage 5V between 3, 4 pin of PCB Pressure sensor terminal?
No
Replace Hub PCB
Yes
Is deviation of outdoor unit as following?"High pressure Max /Min deviation : less than 2"
No
Replace PCB
Yes
Off the vacuum mode of Outdoor Unit
Complete

[Caution]

- If the Outdoor Unit with a history of operation (Auto Trial Operation inclusion) : Maintain the vacuum mode for more than 5 minutes.

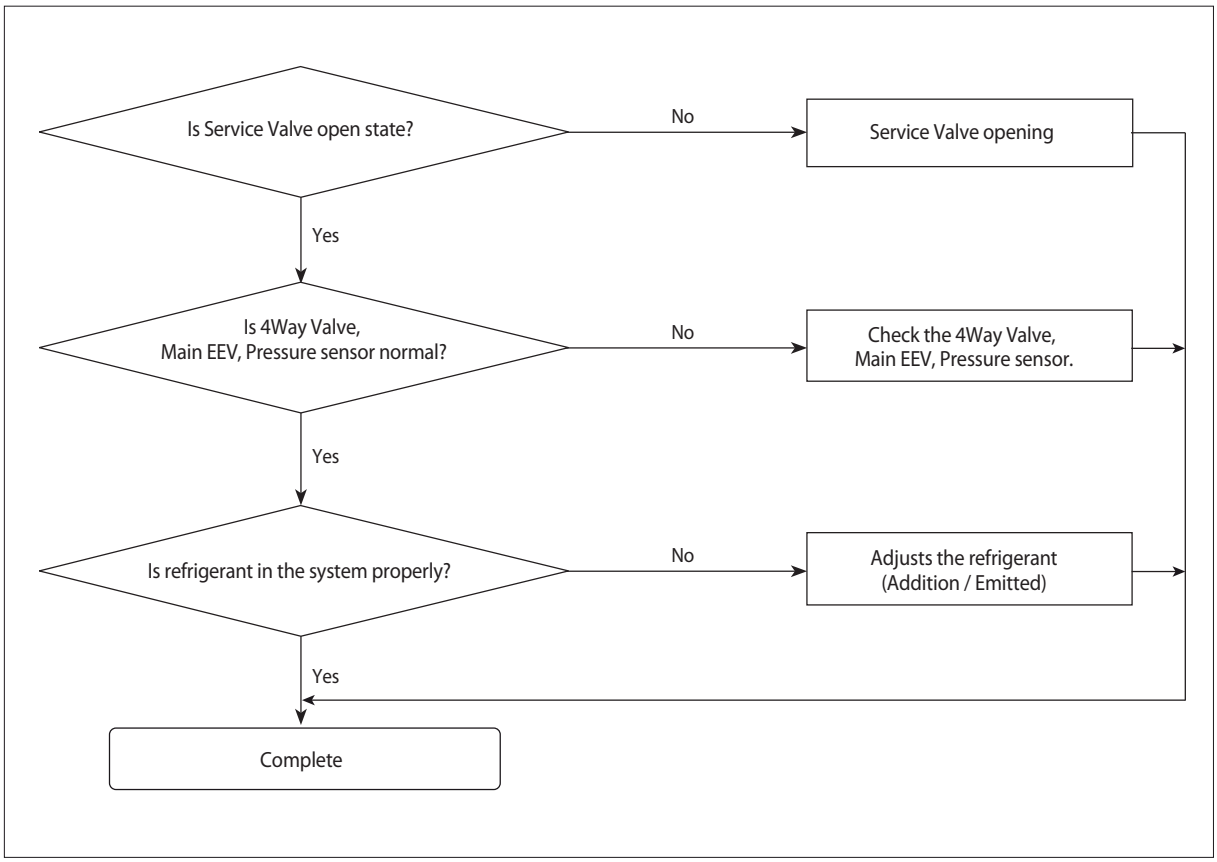
5) Service Valve

■ Inspection item : Outdoor Unit Service Valve is open / closed

■ Error code: E503 (The resulting report "Undetermined")

■ Determine the status of the Service Valve open / closed of the each Outdoor Unit.

■ If the judgment of Outdoor Unit Service Valve is "Undetermined" : Checking in accordance with the following order.



[Caution]

- If the judgment of Service Valve "Undetermined" : Display the error to corresponding Outdoor Unit and then Auto Trial Operation is exited. (Stop the overall system)
- If inspect service valve : Check the Liquid pipe and Gas pipe, Service Valve.
- If the frost formation of Outdoor Heat exchanger, continue Trial Operation until defrost operation begins.
  And then complete after add more than 1 hour operation after end of defrost operation.
  (Execute checking of 4Way Valve and Main EEV together.)
- 4Way Valve abnormal symptoms
  1) Strange noise of compressor to operate.
  2) Indoor unit EVA In/Out maintain the temperature below zero (Less than -0°C)
  3) 4Way Valve : Refer to the Service Manual.
- Main EEV abnormal symptoms
  1) When closed Main EEV opening : Compressor suction degree of overheat impossible to ensure and less than DSH 20K.
  2) When opened Main EEV opening : Compressor suction degree of overheat is high status.
  3) Main EEV : Refer to the Service Manual.
- Pressure sensor abnormal symptoms : Refer to the Service Manual.

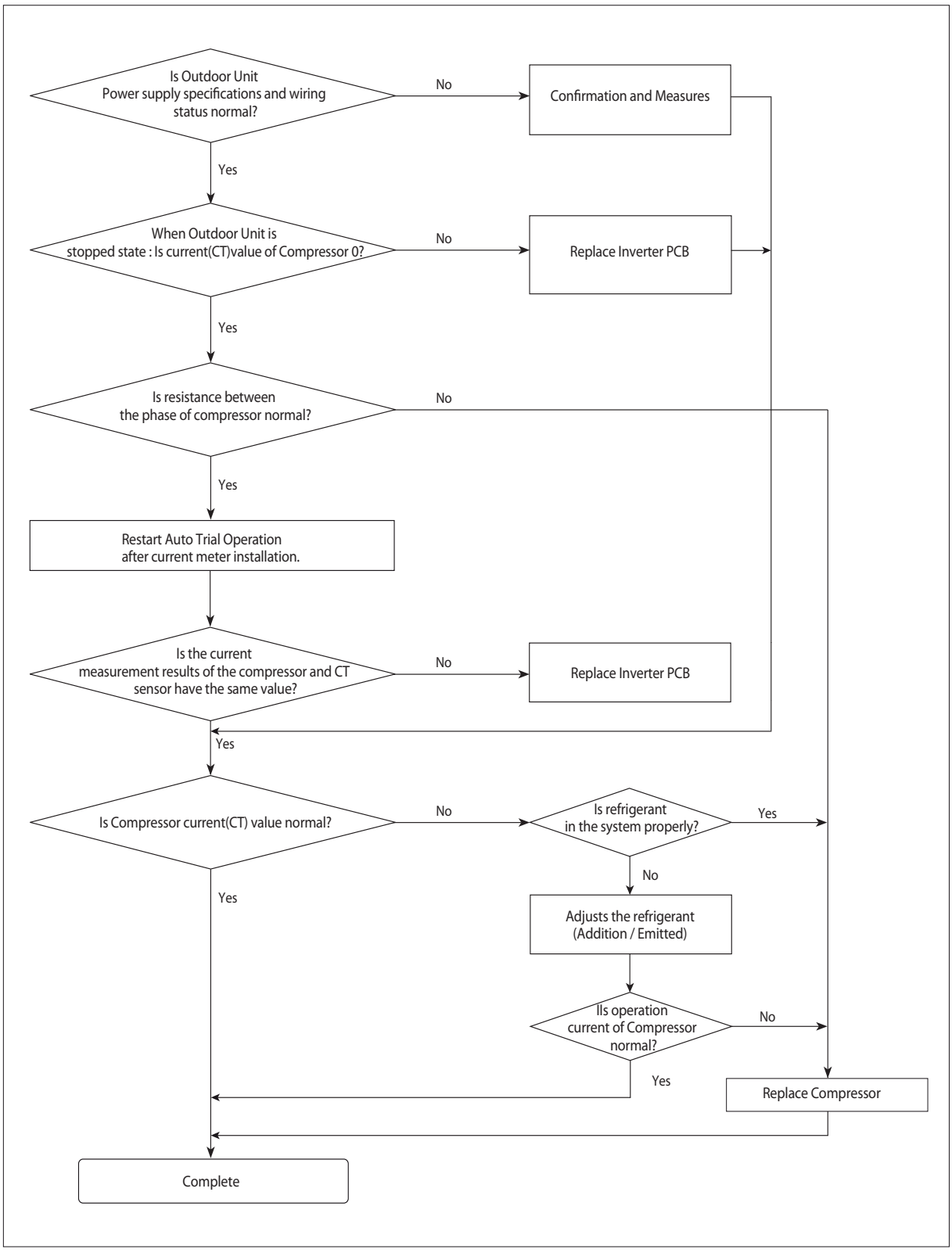
6) Abnormal operation of the Compressor

■ Inspection item : Operation current of Outdoor Unit Compressor.

■ Error code: None (The resulting report "Undetermined")

■ Determine the status of the operating current of the each Outdoor Unit Compressor.

■ If the judgment of operation current of Outdoor Unit Compressor is "Undetermined" :
Checking in accordance with the following order.



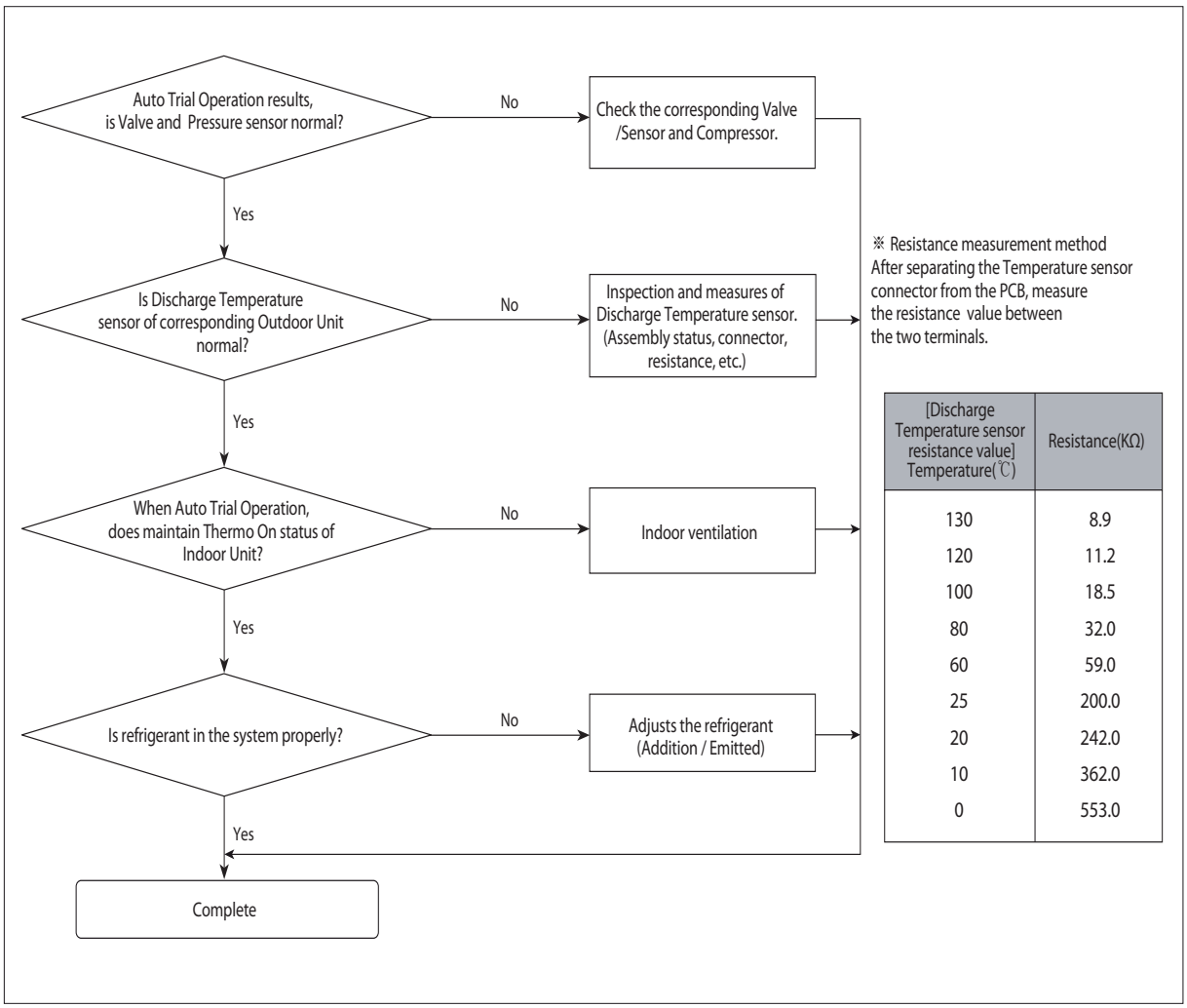
7) Cycle status

■ Inspection item : Cycle status of Outdoor Unit.

■ Error code: None (The resulting report "Undetermined")

■ Determine the Cycle status of the each Outdoor Unit.

■ If the judgment of Cycle status is "Undetermined" : Checking in accordance with the following order.


Auto Trial Operation results, is Valve and Pressure sensor normal?
No
Check the corresponding Valve /Sensor and Compressor.
Yes
Is Discharge Temperature sensor of corresponding Outdoor Unit normal?
No
Inspection and measures of Discharge Temperature sensor. (Assembly status, connector, resistance, etc.)
Yes
When Auto Trial Operation, does maintain Thermo On status of Indoor Unit?
No
Indoor ventilation
Yes
Is refrigerant in the system properly?
No
Adjusts the refrigerant (Addition / Emitted)
Yes
Complete
※ Resistance measurement method
After separating the Temperature sensor connector from the PCB, measure the resistance value between the two terminals.

[Discharge Temperature sensor resistance value] Temperature(℃)	Resistance(KΩ)
130	8.9
120	11.2
100	18.5
80	32.0
60	59.0
25	200.0
20	242.0
10	362.0
0	553.0

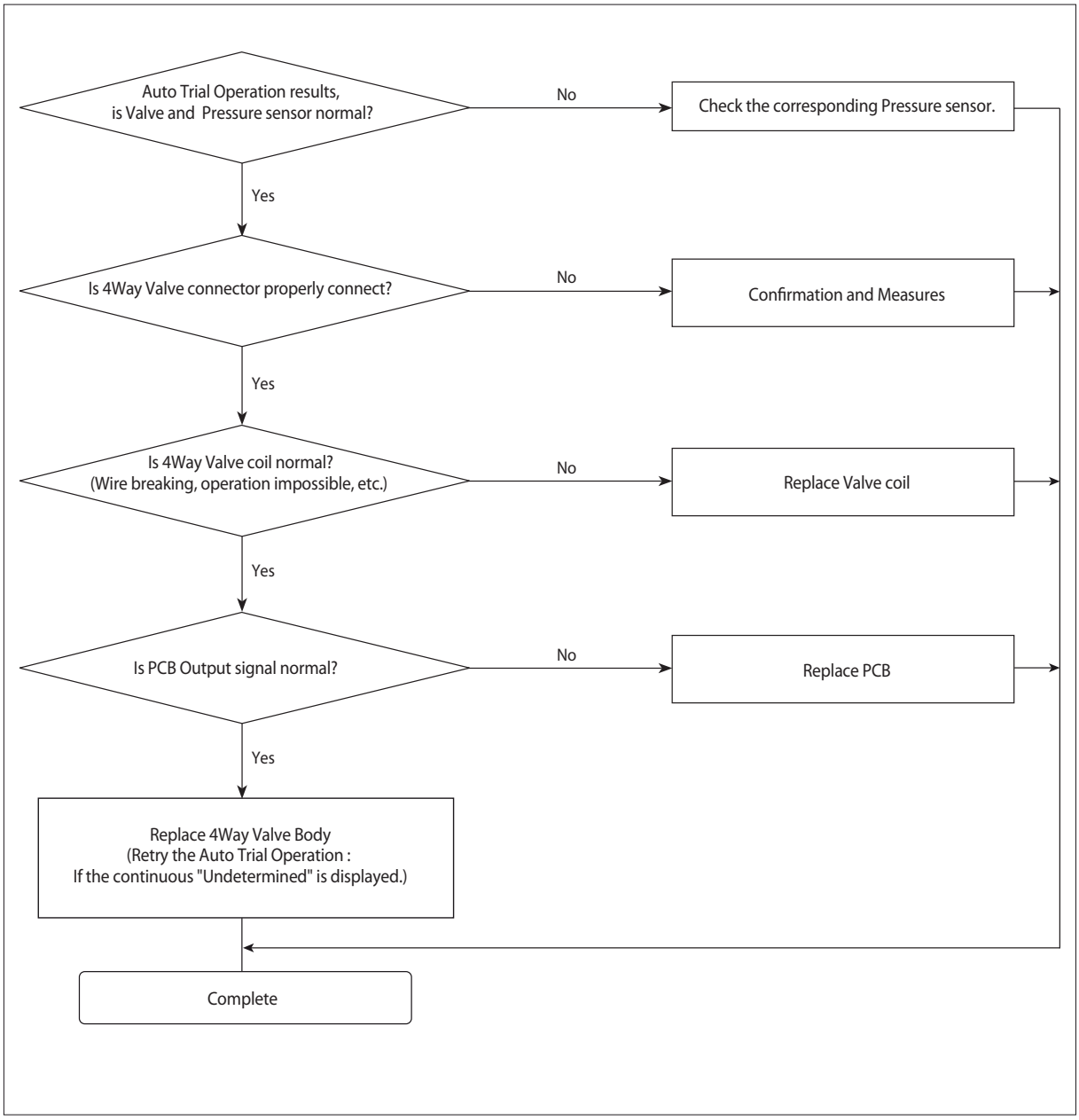
8) 4Way Valve

■ Inspection item : 4Way Valve of Outdoor Unit.

■ Error code: None (The resulting report "Undetermined")

■ Determine the 4Way Valve operation status of the each Outdoor Unit.

■ If the judgment of 4Way Valve is "Undetermined" : Checking in accordance with the following order.



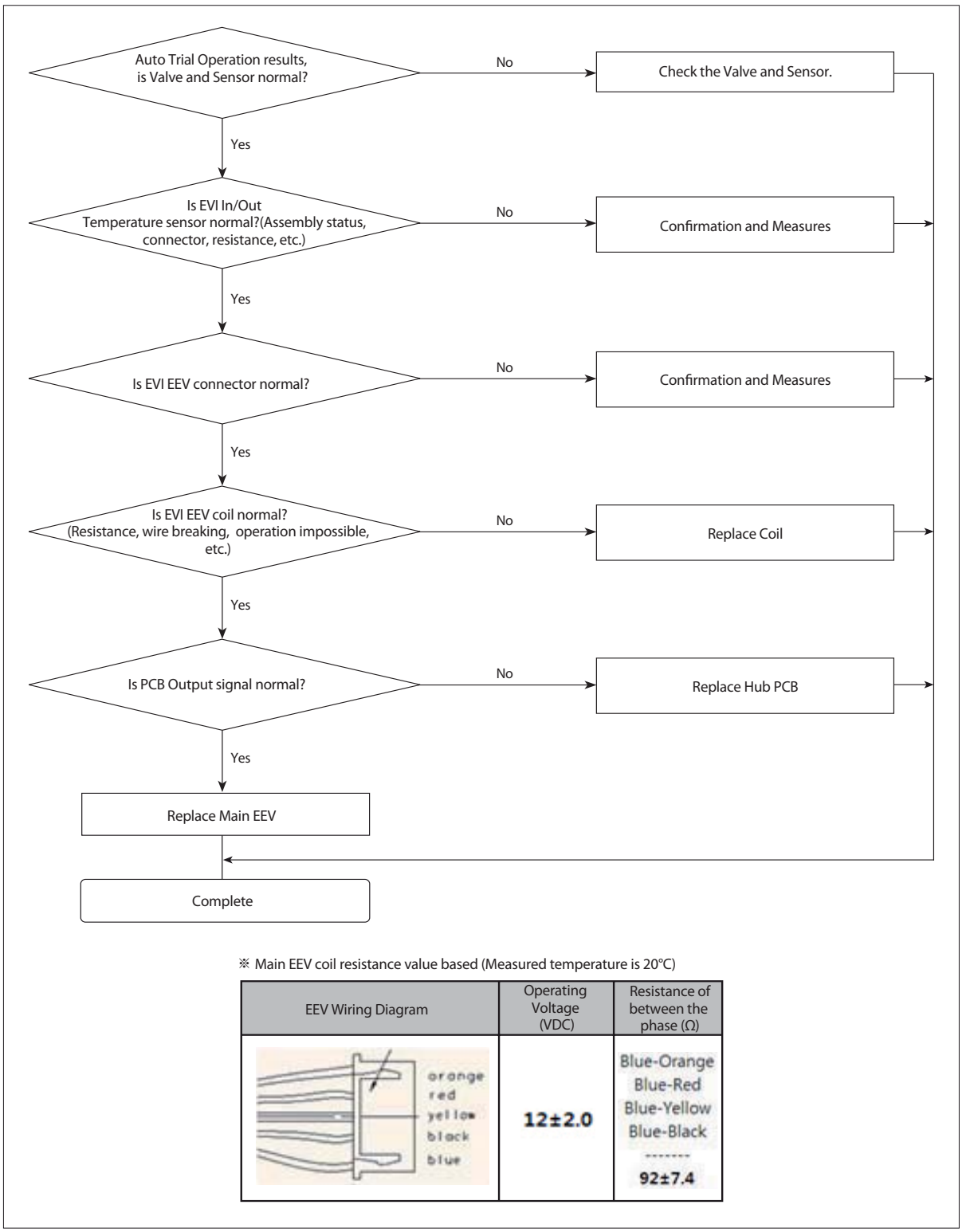
9) EVI EEV

■ Inspection item : EVI EEV of Outdoor Unit.

■ Error code: None (The resulting report "Undetermined")

■ Determine the EVI EEV operation status of the each Outdoor Unit.

■ If the judgment of EVI EEV is "Undetermined" : Checking in accordance with the following order.



※ Main EEV coil resistance value based (Measured temperature is 20℃)

EEV Wiring Diagram	Operating Voltage (VDC)	Resistance of between the phase (Ω)
	12±2.0	Blue-Orange Blue-Red Blue-Yellow Blue-Black ------- 92±7.4

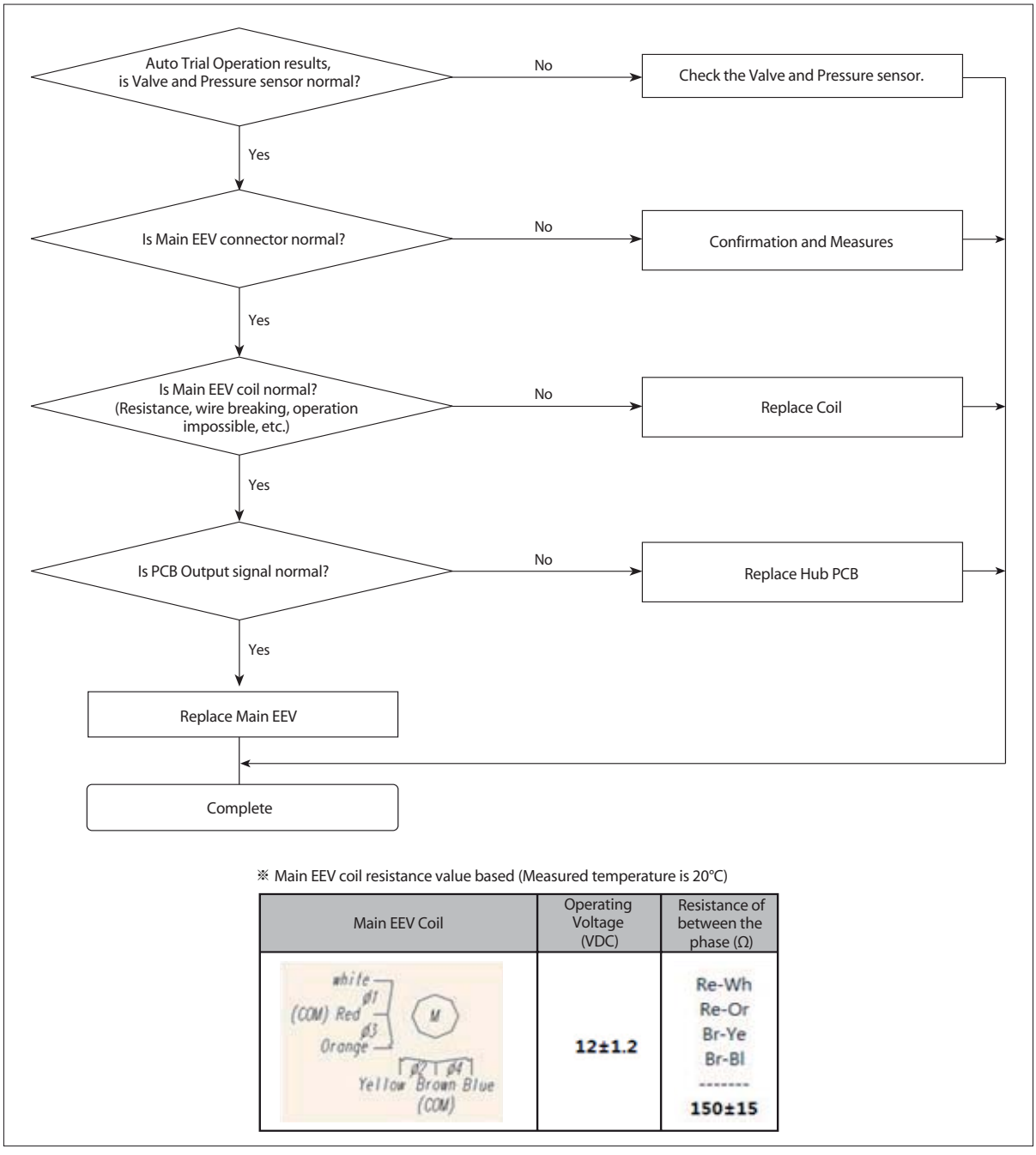
10) Main EEV

■ Inspection item : Main EEV of Outdoor Unit.(Auto Trial Operation : Heating only)

■ Error code: None (The resulting report "Undetermined")

■ Determine the Main EEV operation status of the each Outdoor Unit.

■ If the judgment of Main EEV is "Undetermined" : Checking in accordance with the following order.



※ Main EEV coil resistance value based (Measured temperature is 20℃)

Main EEV Coil	Operating Voltage (VDC)	Resistance of between the phase (Ω)
	12±1.2	Re-Wh Re-Or Br-Ye Br-Bl ------- 150±15

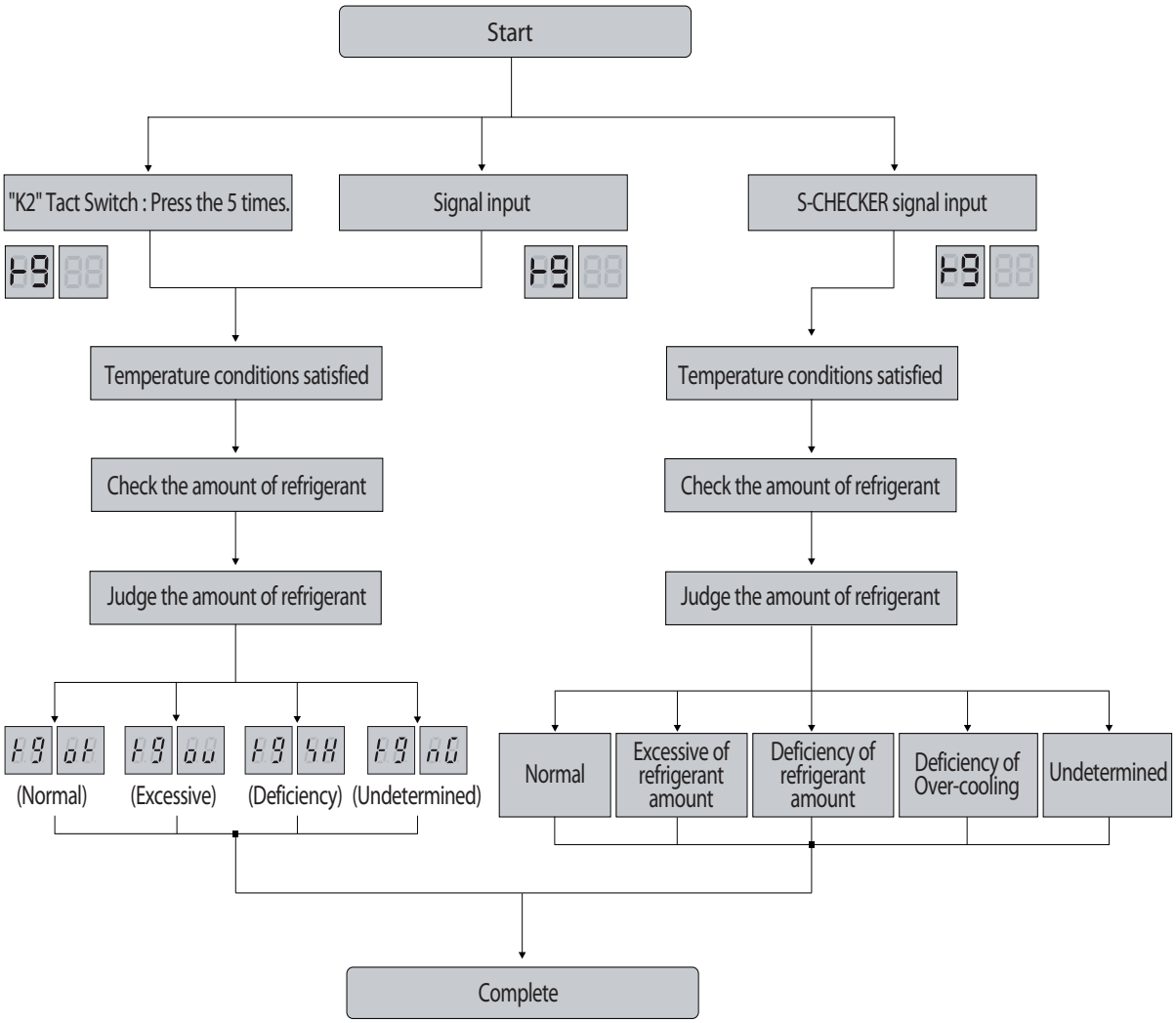
9-1-4 Auto Trial Operation Error Code

Division	Error Code	Description	Remark
Dedicated Error Code	E503	Service Valve is closed	Refer to "Service Valve"
	E505	High pressure sensor breakdown	Refer to "High / Low pressure sensor (Module installed)"
	E506	Low pressure sensor breakdown	

※ Other error codes : Refer to Service Manual.

9-2 Amount of refrigerant automatically checking

Through the detect operation is the ability to verify automatically for the amount of refrigerant.



[Caution]

- If escape the warranty temperatures, can not get the accurate results.
  - Indoor : 20~30°C
  - Outdoor : 5~43°C
- If operation cycle is not stable, Checking the amount of refrigerant can be forced to shut down.
- If did not operation for a long time, or when running the heating operation, the accuracy may be lower.
  Therefore carried out for more than 30 minutes cooling operation.
- Depending on the installation environment, system protection operation is performed, in this case, the check result may be inaccurate.

[How to troubleshoot the judged results]

- Excessive of refrigerant amount : After the 5% emissions of calculated total refrigerant amount, retry Checking the amount of refrigerant.
- Deficiency of refrigerant amount : After the 5% addition of calculated total refrigerant amount, retry Checking the amount of refrigerant.
- Deficiency of Over-cooling : After the 10% addition of calculated total refrigerant amount, retry Checking the amount of refrigerant.
- Undetermined : Checking the amount of refrigerant confirms that is performed in warranty temperatures area.
  Ensure that there is no other problems in the system by Test Operation.

SAMSUNG ELECTRONICS

GSPN (GLOBAL SERVICE PARTNER NETWORK)

Area	Web Site
Europe, CIS, Mideast & Africa	gspn1.samsungcsportal.com
Asia	gspn2.samsungcsportal.com
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